

Rum Jungle Rehabilitation Stage 3

Construction Environmental Management Plan

RJ3-3-MP-003

Document title	Rum Jungle Rehabilitation Stage 3 – Construction Environmental Management Plan
EPBC Number	2016/7730
Project Name	Former Rum Jungle Mine Rehabilitation Project
Proponent	Department of Industry, Tourism and Trade
ABN	84 085 734 992
Approved by	Jackie Hartnett
Date approved	27 January 2022
Document review	Annually
RJM Doc number	RJ3-3-MP-003

Version	Date	Author	Changes made
0.1	21 December 2021	EcOz Environmental Consultants	First Version
0.2	5 January 2022	A. Wilkins DITT	Review and edits
0.3	21 January 2022	EcOz Environmental Consultants	Review and edits
1.0	27 January 2022	J Hartnett	Approve

Glossary

Acronyms	Form
AAPA	Aboriginal Areas Protection Authority
ACM	Asbestos-containing materials
ALARP	as low as reasonably practicable
AMD	acid and metalliferous drainage
CCGC	Coomalie Community Government Council
CEMP	Construction Environmental Management Plan
Cth	Commonwealth
DAWE	Department of Agriculture, Water and the Environment
DIIS	Department of Industry, Innovation and Science
DITT	Department of Industry, Tourism and Trade (formerly DPIR)
DPIR	Department of Primary Industry and Resources
EBFR	East Branch of the Finniss River
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999 (Cth)</i>
ESC	Erosion and Sediment Controls
ESCP	Erosion and Sediment Control Plan
FRALT	Finniss River Aboriginal Land Trust
HSE	Health, Safety and Environment

Acronyms	Form
LDWQOs	locally-derived water quality objectives
MNES	Matters of National Environmental Significance
MP	Management Plan
NT	Northern Territory
NT EPA	Northern Territory Environmental Protection Agency
NTG	Northern Territory Government
QA/QC	quality assurance and quality control
TARP	trigger action response plan
TOs	Traditional Owners
WDL	Waste Discharge Licence
WRD	Waste Rock Dump
WSF	Waste Storage Facilities
WTP	Water Treatment Plant

Technical Abbreviation	Full form
µg	microgram
µs	microsecond
Al	Aluminium
Cd	Cadmium
cm	centimetre
Co	Cobalt
Cu	Copper
EC	conductivity
Fe	Iron
km	kilometre
L	litre
m	metre
Mg	Magnesium
mg	milligrams
Mn	Manganese
Ni	Nickel
SO ₄	Sulphate
U	Uranium
Zn	Zinc

Declaration of accuracy

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying this (Construction Environmental Management Plan RJ3-3-MP-003) is complete, current and correct.
2. I am duly authorised to sign this declaration on behalf of the approval holder.
3. I am aware that:
 - a. section 490 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.
 - b. section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.
 - c. the above offences are punishable on conviction by imprisonment, a fine or both.

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1. Introduction

The Northern Territory Government (NTG; *the proponent*) – represented by the Department of Industry, Tourism and Trade (DITT), in partnership with the Commonwealth of Australia – represented by the Department of Industry, Science, Energy and Resources (DISER), proposes the rehabilitation of the former Rum Jungle Mine and associated satellite mines (*the Project*).

The Project area is comprised of five main components – the former Rum Jungle Mine and its associated satellite mines at Mt Fitch and Mt Burton and the two borrow pits required for rehabilitation of these legacy mine sites:

- Rum Jungle property – Section 2968 Hundred of Goyder.
- Mt Burton – Section 998 Hundred of Goyder.
- Mt Fitch – within Portion 3283.
- Finnis River Aboriginal Land Trust (FRALT) granular material borrow area – within Section 2940 Hundred of Goyder.
- Coomalie Community Government Council (CCGC) low permeability borrow area – Section 2830 Hundred of Goyder.

Note that access and use for both borrow pits are yet to be formally agreed with respective landholders. Consultation for this has been preliminary and parties are supportive however commencement of formal agreements will be triggered on funding confirmation and environmental approval.

1.1. Background

Uranium (and other minerals such as copper and lead) exploration, mining and milling occurred at the Rum Jungle Uranium Field from 1953 to 1971 across these sites (a detailed breakdown of the historical mining activities is located within Chapters 1 and 6 of the EIS). The historic mining and mineral processing practices at the Field caused significant environmental impacts on the Rum Jungle main site (Rum Jungle), and polluted the East Branch of the Finnis River (EBFR).

From 1982 to 1986, a rehabilitation project funded by the Commonwealth Government was undertaken by the NTG. At the time, that project was considered to be at the forefront of mine rehabilitation and attracted international attention from the scientific and mining communities. A subsequent 12-year monitoring program concluded that the rehabilitation effort was successful in achieving its project objectives. Nevertheless, over time it was realised that whilst historical rehabilitation efforts did achieve the original rehabilitation project objectives, more work was required to reduce ongoing environmental impacts and conform to modern standards.

As a consequence, this Project has been developed – a multi-stage rehabilitation program of the former Rum Jungle Mine. The primary goal of the Project is to remedy the environmental condition onsite and downstream within the EBFR by addressing the ongoing Acid and Metalliferous Drainage (AMD) sources, the physical aspects and the ecological condition of site. In addition, historic mining operations have diverted the EBFR from its original course through the site; this is to be remedied as far as possible to restore cultural value of the EBFR.

An Environmental Impact Statement (EIS) has been prepared for Stage 3 of the Project – described in Section 1.2. It identified environmental, cultural and social values relevant to the Project and identified potential impacts to those values from Stage 3 activities. The most significant risks are associated with land clearing, accessing and trafficking remote areas and transporting materials throughout the site.

Development of the EIS is nearing completion, with approval conditions pending. Once the Project has environmental approval, Stage 3 will commence. One condition already flagged is development and implementation of a Construction Environmental Management Plan (CEMP) for Stage 3 (this document).

1.2. Stage 3 activities

Key rehabilitation activities for Stage 3 of the Project are summarised below:

- Waste rock most likely to produce AMD will be used to backfill Main Pit to a maximum 2 m below Dry season Standing Water Level.
- Residual waste rock from Main Waste Rock Dump (WRD), Dyson's WRD and contaminated soils (including from fluvial areas) will be consolidated into two newly-constructed Waste Storage Facilities (WSF).
- Residual AMD-impacted groundwater below existing WRDs (current EBFR contamination pathway) will be captured and treated prior to discharge of remediated waters to the EBFR.
- Mt Burton WRD and surrounding contaminated soils will be excavated and transported to Rum Jungle for inclusion in the new WSF.
- The small WRD at Mt Fitch, located directly south of the pit, and some surface disturbance evident to the west, will be relocated into the Mt Fitch Pit, or transported to Rum Jungle for storage if feasible.
- Landform revegetation will be undertaken progressively on all disturbed areas.
- Weed and fire management programs will be implemented to assist in the successful establishment of native vegetation and improve operational safety.
- Access tracks will be upgraded, as required – this includes construction of haul roads and a culvert crossing to provide all-weather access during construction.
- The EBFR flow will be re-diverted through Main Pit as far as possible, as requested by the Kungarakan and Warai people. The return of flow through the EBFR course holds cultural significance.
- Final decommissioning and removal of the Stage 3 infrastructure from site once works are complete.

These works are likely to take approximately 10 years, with the bulk of earthworks completed within 5 years. Further detail on works timing is located within the Project Management Plan (RJ3-2-MP-002).

Detail and methodologies for the key components are described in the EIS.

1.3. Scope

The entire Project is a multi-stage, management action – with physical works predominantly occurring in Stage 3.

This CEMP is for Stage 3 of the Project only – limited to addressing the risks to environmental, social and cultural values from the 'construction' activities required in Stage 3 to remediate and rehabilitate the project site. Management of risks within future stages will be addressed through a Land Use Management Plan which will be developed prior to commencement of Stage 4, in conjunction with the Contaminated Sites Auditor.

The works that will be undertaken in Stage 3 will be subject to detailed engineering quality assurance and quality control (QA/QC) within the Project Management Plan (RJ3-2-MP-002) and Construction Management Plan (RJ3-3-MP-004). This CEMP does not include these design and engineering QA/QC measures – it focusses only on the potential impacts associated with construction works. In other words, the CEMP assumes that Project design is sound and properly implemented, and therefore only addresses construction-related environmental risks.

This CEMP provides guidance on achieving the project objectives as outlined in the Draft EIS and in Table 1-1. Once the EIS has been finalised, this CEMP will be reviewed to reflect the final EIS, and all Commonwealth and NT approval conditions.

Table 1-1 Rum Jungle Rehabilitation Project Objectives

PROJECT STAGE 3			
PURPOSE	Complete rehabilitation of the former Rum Jungle mine, in a way that maximises value for the Territory and is aligned with the cultural values of Traditional Owners.		
OBJECTIVES	<table border="1"> <tr> <td>Improve the environmental conditions onsite and downstream of site within the East Branch Finniss River.</td> <td>Improve onsite environmental conditions to support future land use, including cultural values.</td> </tr> </table>	Improve the environmental conditions onsite and downstream of site within the East Branch Finniss River.	Improve onsite environmental conditions to support future land use, including cultural values.
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OUTCOMES	<table border="1"> <tr> <td> <ul style="list-style-type: none"> • Surface water quality conditions within the East Branch Finniss River improved to meet locally derived water quality objectives • Chemically and physically stable landforms • Self-sustaining vegetation systems supported within rehabilitated landforms • Physical environmental conditions supportive of the proposed Land Use Plan </td> <td> <ul style="list-style-type: none"> • Flow of the East Branch Finniss River restored to original course as far as possible • Culturally insensitive landforms adjacent to sacred sites removed and relocated, ensuring a culturally safe distance from the sacred sites • Living systems returned, including endemic species to the remaining landforms • Aboriginal cultural heritage artefacts and places preserved • Sources of pollution isolated, including radiological hazards • Maximised opportunities for Traditional Owners to work onsite to aid reconnection to country </td> </tr> </table>	<ul style="list-style-type: none"> • Surface water quality conditions within the East Branch Finniss River improved to meet locally derived water quality objectives • Chemically and physically stable landforms • Self-sustaining vegetation systems supported within rehabilitated landforms • Physical environmental conditions supportive of the proposed Land Use Plan 	<ul style="list-style-type: none"> • Flow of the East Branch Finniss River restored to original course as far as possible • Culturally insensitive landforms adjacent to sacred sites removed and relocated, ensuring a culturally safe distance from the sacred sites • Living systems returned, including endemic species to the remaining landforms • Aboriginal cultural heritage artefacts and places preserved • Sources of pollution isolated, including radiological hazards • Maximised opportunities for Traditional Owners to work onsite to aid reconnection to country
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KEY APPROACH	The rehabilitation work will be packaged to enable Territory businesses to participate and to create participation opportunities for Aboriginal Territorians.		

This CEMP considers EPBC protected matters, as well as addressing the following NT EPA environmental factors for Stage 3:

- Historic and cultural heritage
- Terrestrial environmental quality
- Inland water quality
- Hydrological processes
- Aquatic ecosystems
- Terrestrial flora and fauna
- Social (with respect to nuisance and traffic only).

Remaining factors discussed within the EIS (social and economic, human health and safety, and radiation) are addressed in separate management plans.

1.4. Overview

This CEMP identifies and presents management objectives and the benchmarks for determining whether these have been met (see Section 4), the environmental mitigation and management measures required to mitigate the potential risks to achieving the management objectives (see Section 5) and assess the likelihood that the measures are successful (see Section 6). This CEMP also outlines the reviewing and auditing program, monitoring program, reporting obligations, roles and responsibilities and document control processes that are required to meet compliance with this CEMP.

This CEMP has been developed to address the EPBC specific guidance on construction environmental management plans – see Appendix E. It also incorporates the requirements of:

- The *EPBC Act* controlling provisions relevant to the Project which are:
 1. Listed threatened species and communities (sections 18 & 18A).
 2. Protection of the environment from nuclear actions (sections 21 & 22A).
- *Environmental Assessment Act 1982*
- Applicable licence approval and/or permits.

2. Environmental condition and protected matters

2.1. Existing environment

Historic mining and rehabilitation activities have altered the landscape within the former Rum Jungle Uranium Field, most prominently at the Rum Jungle site. Most of the environmental and cultural values within the Rum Jungle site are compromised because historic activities have led to present-day contamination processes and physical changes.

2.1.1. Water

The Project sits within the headwaters of the Finnis River catchment. The majority of the Project footprint is within the EBFR sub-catchment, the exceptions being Mt Burton and Mt Fitch which are adjacent to the West Branch of the Finnis River, and the low permeability borrow area which is adjacent to Meneling Creek (which flows into the West Branch).

The EBFR is an ephemeral stream which drains north-west, joining the Finnis River approximately 8 km downstream of the Rum Jungle site. Base flow is generally not established until sustained monsoonal rains arrive. The Finnis River is a perennial river that flows to Fog Bay. During the Wet season the river often overbanks whilst during the Dry season the river typically consists of a series of billabongs about 3 m in depth connected by shallower sections.

Water quality at the former Rum Jungle Mine site is characterised by elevated SO_4 , Mg and most metals related to AMD, Cu being the most significant from an ecotoxicology perspective, and this impacts the health of the Finnis River downstream. The primary contaminant of concern (onsite and downstream) is copper resulting from AMD. Groundwater quality in some areas, predominantly around the copper leach pad, are also impacted by historic AMD sources (2019 Draft EIS chapter 10).

2.1.2. Ecology

2.1.2.1. Terrestrial

The Project is predominantly a highly disturbed landscape because of historical mining activity and ground disturbance, which has led to ideal conditions for Gamba Grass infestation giving rise to altered fire regimes. This has had a negative impact on the terrestrial flora and fauna values of the footprint and surrounds. This is commensurate with surrounding terrestrial conditions and Gamba Grass impacts across the region.

Five threatened species were identified as having a high or medium likelihood of occurring within the project footprint:

- Darwin Cycad (*Cycas armstrongii*)
- Partridge Pigeon (eastern subspecies) (*Geophaps smithii smithii*)
- Black-footed Tree-rat (Kimberley and mainland NT subspecies) (*Mesembriomys gouldii gouldii*)
- Masked Owl (mainland Top End subspecies) (*Tyto novaehollandiae kimberli*)
- Red Goshawk (*Erythrotriorchis radiatus*).

For the latter two species, the areas within the project footprint that will be directly disturbed by land clearing are unlikely to represent important habitat.

2.1.2.2. Aquatic

The Finniss River has been subject to contamination from the Rum Jungle Mine for more than sixty years. The EBFR remains in a highly modified state due to ongoing impact of copper from the site's AMD processes. The riparian vegetation assemblage is recovering well from the severe dieback resulting from the Old Tailings Dam failure and other unregulated pollution events during and immediately following the period of active mining. Fish communities from sites downstream of mine inputs prior to the 1980's remediation are significantly different from unexposed sites, being depleted in abundance and diversity. However, this was not the case for samples post-remediation, where there appeared to have been recovery of fish communities immediately downstream of the confluence.

2.1.3. Cultural and historical heritage

The Coomalie region has a diverse mix of cultural aspects. Traditionally, indigenous people lived in the area and the original inhabitants were the Awara, Kungarakan and Warai Peoples. Warai and Kungarakan are recognised as the joint Traditional Owners of the Rum Jungle site. Consultation with Kungarakan and Warai people over time has led to the development of an understanding of culturally significant species and flora specimens.

Several archaeological field surveys have been carried out over time in order to develop an understanding of the cultural heritage profile across the entire Project. Combined, the surveys identified 16 Aboriginal objects described as isolated artefacts. A further 11 Aboriginal objects were described as 'isolated artefacts - probable sites' because they were recorded in conditions of low visibility in environments normally associated with larger sites. The surveys documented 13 Aboriginal places, one historical object, six historical places and one unidentified feature. All these places and objects have been assessed as significant under the terms of the *Heritage Act*, or potentially significant in the case of the unidentified feature. The unidentified feature demonstrates human activity in the recent past (last 100 years), but cannot be further assessed without invasive techniques, which are not warranted at this stage.

No heritage places or objects were identified in the proposed low permeability material borrow area and several objects were identified in the proposed granular material borrow area, however these are planned to be avoided through project design.

An AAPA Authority Certificate has been issued for the rehabilitation of the Rum Jungle Mine site and includes works within recorded sacred sites. AAPA certificates for borrow pits, Mt Burton and Mt Fitch are pending.

2.2. Protected matters

The Project is a controlled action that required assessment and approval under the *EPBC Act*. The controlling provisions protected under Part 3 of the *EPBC Act* are:

- Listed threatened species and communities (sections 18 & 18A).
- Protection of the environment from nuclear actions (sections 21 & 22A).

The EIS concluded that the proposed rehabilitation of the site is not likely to impose significant adverse effects on the environment. The implementation of a Radiation Management Plan and the Land Use Management Plan will further reduce risks to both humans and the environment resulting in a low residual impact. Active steps in the project design phase have been taken to reduce the need to handle radiological materials across the project and to retain existing below surface storage for the historic mine tailings.

The assessment of risks to MNES and mitigation measures described to protect biodiversity, surface and ground water, and cultural heritage values will minimise risks to the environment within (and beyond) the project area. The project therefore is unlikely to cause significant impacts to MNES.

3. EPBC Act approval conditions

At the time of publishing this CEMP, no *EPBC Act* approval conditions have been issued. Pending provision of these conditions, this section will use the environmental commitments listed within Section 4 of the [Supplement to EIS](#).

Table 3-1: EIS Commitments in lieu of EPBC approval conditions

Commitment		EIS Section	Relevant MP
Historic & Cultural Heritage			
9.	Conform to requirements of AAPA Authority Certificate(s).	8.3.1	Cultural Heritage Management Plan (CHMP)
11.	Avoid disturbance of known cultural heritage as far as possible through project design.	8.2, 8.3	CHMP, Final Land Use Plan
Terrestrial Environmental Quality			
25.	The Proponent is committed to working with the NT EPA to develop a landfill management plan.	Supp	Landfill Management Plan
Inland Water Quality			
26.	Water abstracted from the two pits during Main Pit backfilling will be treated prior to release to EBFR	7.10, 10.7.1	Water Management Plan
27.	Contaminated groundwater will be pumped and treated prior to release to EBFR.	7.10, 10.7.1	Water Management Plan

Commitment		EIS Section	Relevant MP
28.	Treated water use will be maximised onsite in earthmoving works.	7.10, 10.7.1	Water Management Plan
29.	LDWQOs have been established and will be applied for the Project.	7.10, 10.7.1	Water Management Plan
30.	Intermediate Pit will be drawn down to provide freeboard capacity for high rainfall events to capture overflow water from the Main Pit during backfilling activities.	10.7.1	Water Management Plan
32.	Additional monitoring and reporting details will be established within the WDL process.	10.7.2	Draft Monitoring Plan
Hydrological Processes			
33.	Treated water from the WTP will be recycled onsite as far as possible with earthmoving works.	11.3	Water Management Plan
Terrestrial Flora and Fauna			
48.	Riparian vegetation buffers will be applied to the borrow areas.	14.4.1	Vegetation Clearing Procedure, Final Land Management Use Plan
49.	A Fauna Spotter Catcher will be present for all vegetation clearing works.	14.4.1	Vegetation Clearing Procedure
50.	Darwin Cycads will be salvaged as per a Cycad Salvaging Procedure.	14.4.1	Cycad Salvaging Procedure
51.	Mimosa and Gamba Management Plans will be developed and implemented.	14.4.2	Weed Management Plan
52.	Revegetation systems will be developed for site.	7	Revegetation Management Plan
53.	A Feral Animal Management Plan will be developed.	Supp	Feral Animal Management Plan
EPBC Matters			
86.	Resources (rock armour, cleared vegetation etc.) will be salvaged and reused from within the project work area as far as possible.	17.5.3	Final Land Use Plan
87.	Wastes will be stored and recycled onsite as far as possible.	17.5.3	Waste Management Plan

4. Performance standards and targets

4.1. Project objectives

The overall Project's high-level objectives are two-fold – environmental remediation and restoration of cultural values of the site, as described below:

- Improve the environmental condition onsite and downstream of site within the East Branch Finnis River (EBFR). This includes the following key outcomes:
 - Improved surface water quality conditions within EBFR in accordance with locally derived water quality objectives (LDWQOs).
 - Achieve chemically- and physically-stable landforms.
 - Support self-sustaining vegetation systems within rehabilitated landforms.
 - Develop physical environmental conditions supportive of the proposed Land Use Plan.

- Improve onsite environmental conditions to support future land use, including cultural values. This includes the following key outcomes:
 - Restoration of the flow of the EBFR to original course as far as possible.
 - Remove culturally-insensitive landforms from being adjacent to sacred sites and relocate ensuring a culturally-safe distance from the sacred sites.
 - Use appropriate local indigenous plant species to stabilise constructed surfaces and achieve a substantial subset of characteristic assemblage of biota present.
 - Preserve Aboriginal cultural heritage artefacts and places.
 - Isolate sources of pollution including radiological hazards.
 - Maximising opportunities for Traditional Owners to work onsite to aid reconnection to country.

4.2. Management objectives

The objectives mentioned above are for the entire Project. For this CEMP – which addresses only construction activities – the Project objectives have been adapted into the following management objectives:

- Released water offsite is in accordance with locally-derived water quality objectives (LDWQOs).
- Minimise and contain erosion within site.
- Retain and improve biodiversity values on site.
- Preserve heritage and cultural values on site.
- Minimise impacts to the community.

Heritage and cultural values are further addressed within the Cultural Heritage Management Plan RJ3-4-MP-013.

As noted in Section 1.2, radiological hazards are addressed in the Radiation Management Plan RJ3-4-MP-029.

4.3. Management benchmarks

For this CEMP, **performance standards** have been developed in accordance with SMART (Specific, Measurable, Achievable, Relevant, Time-bound) criteria evidence achievement of quantitative management objectives. They include:

- a. **performance indicators**, which are used to measure performance against a management objective, and are specific physical, chemical or biological parameters that represent environmental health or condition.
- b. **performance criteria**, which are the numerical values for a performance indicator and may be:
 - i. an acceptable level beyond which there is likely to be an unacceptable impact to protected matters (**threshold criteria/stop work**), and if breached may require corrective actions.
 - ii. a level or multiple levels to forewarn of the approach of an unacceptable impact to protected matters (**trigger criteria**), and if breached will require mitigation activities (**trigger action response plan, TARP**) to avoid realisation of that impact.
 - iii. a level to achieve and maintain a particular management objective (**completion criteria**).

Targets have been developed for management objectives that do not have quantifiable parameters. These targets will evidence the achievement, or non-achievement, of qualitative management objectives.

5. Management measures

Appendix A contains the management table. In the table, all significant risks to management objectives are presented, followed by the management measures that will be employed to minimise the likelihood of the risk manifesting.

The potential risks to management objectives provided in the table come from the risk assessment table provided in EIS Risk Register (GHD 2019f). The risk assessment table was generated in accordance with *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines*, whereby each environmental risk was rated in terms of likelihood and consequence, which were then used to generate an overall risk rating of low, medium, high or severe.

In general, only risks relating to construction activities that had a residual risk rating above 'low' have been addressed in the management table. This is because most residual risks assessed as low are mitigated through:

- Design – e.g. consultation with the Warai and Kungarakan on the placement of WSF to avoid impact to culturally-significant area or objects, maximising use of already cleared/disturbed area for new constructed landforms.
- The QA/QC process – e.g. a rigorous set of geotechnical and geochemical standards required for the constructed Waste Storage Facilities, to be survey controlled.
- The requirements of AS/NZS standards – e.g. design of bulk fuel storage facilities in line with Standards.
- Industry best-practice – e.g. management of onsite food waste to minimise proliferation of pest animals.

Reference is made throughout the management table to separate management plans and procedures. Refer to these for further detail regarding monitoring, triggers etc.

The management table focuses on erosion and sediment control, revegetation, weed management and preservation of cultural heritage.

Note: Details regarding the Water Treatment Plant (WTP) are yet to be confirmed as a reference design has been produced though it is likely that the market will have advanced solutions. This CEMP assumes the WTP will be a closed system with no pathways for waste products to impact upon surface or groundwater.

6. Risk of achieving management objective

For each set of management measures, the management table - Appendix A - assesses the risk that the measures will not prevent a potential impact to a management objective from occurring. A qualitative approach was used, focussing on likelihood of management success – as per Table 6-1. When assigning likelihood descriptors, the probability of the maximum credible consequence – assuming the specified planned measures are in place and are operating at their expected level of performance – was taken into account. The adequacy of the specified controls to manage the risk was also considered when assigning likelihood descriptors.

Table 6-1: Likelihood descriptors

Likelihood	Explanation
High	The proposed management measures are likely to reduce to 'as low as reasonably practicable' (ALARP) the potential risk to the management objective
Medium	The proposed management measures should reduce to ALARP the potential risk to the management objective, but there is some uncertainty around their effectiveness.
Low	There is sufficient uncertainty regarding the effectiveness of proposed management measures such that there is a reasonable chance that they will not reduce to ALARP the potential risk to the management objective

Most management measures were assessed as having a high likelihood of success at ensuring management objectives are met. This is because the measures proposed are industry-proven, best practice and/or will be subject to ongoing adaptation in response to monitoring.

No proposed measures were assessed as having a low likelihood of success; however, the following were considered as having a medium likelihood of success:

- Overtopping of the Main Pit / Intermediate Pit system must be managed through achieving water quality objectives as directed within the Water Management Plan RJ3-4-MP-010. Rainfall and flood events that are likely to cause overtopping are a common within the region of the Project. Water quality objectives must be achieved and regularly managed to reduce the impact of overtopping.
- The Revegetation Management Plan RJ3-4-MP-009 is a bespoke, adaptive approach based on lessons learnt from similar revegetation projects. The monitoring process ensures learning from initial attempts and, if required, the approach can be modified to ensure constant improvement in the likelihood of success. Nevertheless, revegetation of disturbed land remains a challenging undertaking, the success of which can be impacted by many variables.
- Weed management is only successful if it is undertaken strategically and with sufficient resources and time. The Weed Management Plan RJ3-4-MP-011 has been developed to meet these considerations and employs recent advances in management of Gamba Grass. Nevertheless, the fact that the site and surrounds are heavily infested mean that any lapses in effort will lead to weed spread.

7. Auditing, monitoring and reporting

The management objectives are outlined within this CEMP provide the target for environmental management. The auditing, monitoring and reporting processes aim to assess whether environmental objectives are being achieved. This CEMP stipulates performance criteria for each relevant management section against which monitoring, or auditing data can be compared.

Where monitoring and auditing identifies that performance criteria are not being met, corrective actions must be implemented. Corrective actions will be assigned as appropriate for the nature and scale of the non-conformance. Generally, minor non-conformances will require the management actions to be implemented, additional toolbox talks or training for staff, or additional remedial works to occur. Where the non-conformance is major, an incident investigation will be undertaken to determine the causes and impacts of the non-conformance and outline specific remedial and corrective actions to avoid a reoccurrence.

The proponent is responsible for assessing whether environmental objectives are being achieved.

7.1. Review and auditing program

This CEMP, its procedures and controls will be reviewed and audited both internally and by an independent auditor throughout the Project. A specific schedule for auditing will be developed prior to commencement of ground works that will reflect any commitments or requirements identified in the EIS approval conditions. The Contaminated Sites Auditor will be required to include audit of performance against EIS commitments.

The audits will specifically compare on-ground works with management commitments and performance objectives. Any non-conformance with these criteria will trigger the implementation of corrective actions, and associated reporting where required. Where management measures are not achieving objectives and performance criteria, the CEMP will be updated as part of an adaptive approach.

Adaptive management measures could include corrective actions such as additional controls, increased testing regimes, altering clearing schedules and increasing sustainable development measures. Adaptive management provides an opportunity for improvement before significant harm to onsite and offsite environmental values arise.

7.2. Monitoring

The monitoring associated with this CEMP can be found within the Environmental Monitoring Plan RJ3-4-P-017 and detailed in the Draft Monitoring Plan (EIS Appendix 1 DPIR 2020a). The measures therein come predominantly from the EIS.

The primary responsibility for monitoring the potential environmental impacts of the Project will be with DITT, the responsibility for implementation however may be delegated to contractors. DITT be responsible for ensuring that all employees, officers, contractors and agents associated with the project are familiar with the elements of the approved CEMP and the relevant permits, and comply with these and the requirements of environmental legislation.

All contractors will be expected to comply with this CEMP and its sub-plans and all commitments made in the EIS. Contractors will also operate under the Construction Management Plan (RJ3-3-MP-004) and related sub-plans and procedures.

During construction, the Health, Safety and Environmental Manager will be responsible for daily and weekly monitoring requirements that are stipulated in this CEMP. Should a contractor be engaged for any component of the project, they will receive written communication instructing them of their obligations under this monitoring program.

Daily and weekly monitoring will be in the form of checklists and inspections of active construction areas. Operational monitoring – e.g. fuel and chemical storage and use, and training logs – will also form part of the monitoring framework. Databases will be developed for the storage of monitoring data. Where relevant, compliance criteria will be included in the database for immediate comparison of monitoring data and identification of non-compliances.

Monitoring of structures, such as the WSF and Pits will also be undertaken as per the QA/QC process.

7.2.1. Locally-Derived Water Quality Objectives (LDWQOs)

With improvements to water quality being integral to the success of this project, considerable work has been undertaken to develop a set of LDWQOs for the EBFR. As detailed in Chapter 10 of the EIS, the intention is to continually improve towards achievement the LDWQOs during Stage 3. The LDWQOs will be adopted as trigger values in a Waste Discharge Licence (WDL).

7.3. Reporting obligations

7.3.1. EPBC Act Reporting

The Department of Agriculture, Water and the Environment (DAWE) Compliance and Enforcement Branch deliver an effective compliance monitoring and audit regime for approvals under the *EPBC Act* – thus ensuring compliance with conditions of approval. The Compliance and Enforcement Branch is responsible for providing assistance to EPBC approval holders so that they can meet the obligations set out in the approval.

At the time of publishing this CEMP, no EPBC Act approval conditions have been issued. Until these conditions are announced, this section will act as a place holder for the intended reporting obligations and will be updated once these conditions have been set.

External reporting is required to meet conditions of approval and statutory requirements. These will be confirmed following receipt of the conditions of approval, but are expected to include:

- Annual report on compliance with environmental authority and other approvals.
- Incident report where environmental harm has occurred.

7.3.1.1. Annual compliance reports

Compliance reports help to ensure projects with the potential to impact on matters protected under the *EPBC Act* are implemented as approved. The compliance reports also help the Australian Government to understand how well approval conditions are being understood and applied, and contribute to improving the effectiveness of the Department's operations. Further information can be found on the Department's website at <https://www.awe.gov.au/environment/epbc/publications/annual-compliance-report-guidelines>. A template for the compliance report has been provided within Appendix C.

7.3.1.2. Environmental incident reports

Examples of breaches under the *EPBC Act*:

- Taking action without approval
- Breaching an approval condition
- Commencing an action after submitting a referral but it is not yet approved
- Failing to take action in a specific manner
- Failing to obtain or not complying with a permit.

7.3.2. Further environmental reporting

7.3.2.1. Internal incident reporting

Incident management, including environmental incidents will be part of DITT's Health, Safety and Environmental Management System.

Environmental incident reports are required for the following events:

- Uncontrolled spill or release of substance – i.e. fuel, lime, chemicals, weed infested soils, contaminated water, ESC's holding water.
- Entry into a no-go or quarantine zone – i.e. weed quarantine, culturally restricted areas, vegetation clearing.
- Discovery or disturbance to unknown culturally-significant area or objects.
- Unplanned vegetation death / disturbance.
- Water quality exceed LDWQOs's.
- Erosion or sedimentation.
- Unexpected fauna mortality – i.e. fish kills, bird deaths, multiple mammal deaths.
- Bank erosion or instability within river channel.
- New weed species detected attributed to construction activities.
- Increase in extent of known weeds.

The prompt and accurate reporting of incidents will be a responsibility of all employees and supervisors/management will be held accountable for compliance with this requirement. An incident register will be maintained, and key incidents will be widely shared to reduce the likelihood of incident reoccurrence.

Each incident will be investigated to determine the root cause and how controls can be adjusted to prevent reoccurrence. Actions will be developed, assigned and tracked using the incident management system. Regular check and audits, with timeframes, will be undertaken following an incident to ensure that corrective actions are in place.

7.3.2.2. External / mandatory incident reporting

Any incidents that cause, or may cause, pollution resulting in material or serious environmental harm (as defined under the *Waste Management and Pollution Control Act NT*) will be reported to the NT EPA.

Any complaints on dust or noise emissions received from the community will be investigated and outcomes reported back to the complainant. This process will be managed by the DITT Community and Training Officer. DITT's complaints processes detail the requirements for recording complaints, investigating and responding to them and the timeframes for each step.

Additional reporting may be condition as part of the NT EPA approval of the EIS.

The Waste Discharge Licence (WDL) required for the Water Treatment Plant (WTP) will have reporting requirements. The LDWQOs will be adopted as trigger values in the WDL and any exceedances will be reported upon in accordance with the requirements of the WDL. Reporting will involve a notification to the NT EPA and all exceedances will be documented in an annual Monitoring Report.

7.4. Document management

The Document Control system is detailed in '*Rum Jungle Rehabilitation Project Stage 3 – Document Control Procedure*' Reference RJ3-4-Pr-003 (under development).

The document control procedure will utilise a cloud-share system such as Microsoft Software SharePoint to store and manage all operational system documents, drawings and plans.

The procedure will be fully compliant with ISO 9001:2015 Quality Management Systems. Key components of the procedure include:

- Approve documents for adequacy prior to issue.
- Review, update as necessary, and re-approve documents.
- Identify the changes and current document revision status.
- Make relevant documents available at points of use.
- Ensure the documents remain legible and readily identifiable.
- Identify external documents and control their distribution.
- Prevent obsolete documents from unintended use.
- Apply suitable identification if obsolete documents are retained.

In addition, the procedure will also be fully compliant with ISO 19475:2021 Document Management:

- This standard specifies the minimum requirements necessary to maintain the authenticity, integrity and readability of documents managed by an electronic document management system. Clarifying the methods and procedures for appropriately handling electronic documents promotes the usability of the documents, in both a legal and business context.
- This standard expresses a general business process as a document handling process. The document handling processes include receiving, processing and delivering the documents as follows:
 - approving the receipt of a document in a manner that is appropriate for a work process.
 - storing the formal document in the work process environment.
 - delivery of the document to another organization.
- This standard establishes the controls for execution of the work processes while maintaining the authenticity and integrity of the document received.
- This standard establishes the policies for the storage of documents used as part of the work process. It also details the controls for performing the receipt and conversion process appropriately.

8. Role and responsibilities

The proponent is responsible for over-arching compliance monitoring and reporting. Project-specific roles and responsibilities for environmental management will be assigned, including those of the environmental manager, environmental advisors and supporting staff. The responsible parties for implementing and monitoring this CEMP are provided in Table 8-1. The Project Director is responsible for the implementation of the CEMP, which delegated roles as below.

Table 8-1: Summary of CEMP roles and responsibilities

Aspect of CEMP	Responsible personnel
Overall implementation of the CEMP	Project Director
Managing environmental incidents	HSE Manager
Compliance with environmental management objectives	HSE Manager

Monitoring and reporting environmental objectives	HSE Manager
Undertaking environmental survey, weed management, fauna spotter catchers	LMC and HSE Technicians
Complaints and Community Engagement	Community and Training Officer
Informing and guiding on Cultural compliance	TOs/LALC
Reporting – compliance and incidents	HSE Manager
DITT representative in control of work area – conformance to standards for clearing, cycad translocation, dust and other direct construction responsibilities outlined	Superintendent

9. Supporting documents

9.1. Technical reports

Draft EIS and all Supplementary Reports, Information Requests and Appendices of these documents.

9.2. Management plans and procedures

- RJ3-4-MP-008 Feral Animals Management Plan
- RJ3-4-MP-009 Revegetation Management Plan
- RJ3-4-MP-010 Water Management Plan
- RJ3-4-MP-011 Weed Management Plan
- RJ3-4-MP-012 Waste Management Plan
- RJ3-4-MP-013 Cultural Heritage Management Plan
- RJ3-4-MP-014 Erosion and Sediment Control Plan
- RJ3-4-MP-015 Hazardous Materials MP
- RJ3-4-MP-017 EBFR Restoration Plan
- RJ3-4-MP-018 Vegetation Clearing Procedure
- RJ3-4-MP-019 Cycad Salvaging Procedure
- RJ3-4-MP-020 Land Use Management Plan
- RJ3-4-MP-021 Traffic Management Plan
- RJ3-4-MP-029 Radiation Management Plan
- RJ3-4-F-004 Ground/Vegetation Disturbance Request Form
- RJ3-4-F-002 Incident Report Form
- RJ3-4-Pr-009 Rehabilitation Media Stripping and Stockpiling Procedure
- RJ3-4-P-024 Monitoring Plan
- RJ3-4-Pr-005 Groundwater Monitoring Procedure
- RJ3-4-Pr-006 Surface Water Monitoring Procedure

- RJ3-3-P-010 Engagement and Communications Strategy

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Appendix A Management Table

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
Water released offsite is in accordance with LDWQOs														
1	Flood event causes overtopping of the Main Pit / Intermediate Pit system resulting in reduced water quality entering into the EBFR (with associated impacts)	Implement Water Management Plan, including: - diverting 100% of EBFR flows into the EBDC - utilising Pits as 'live storage' to absorb potential high rainfall events - maintaining 'live storage' through WTP discharges - maintaining 'live storage' through continuous pumping and treatment of water	11.3.1	Water MP	Major	Rare	Medium	No pit overtopping events that exceed water quality objectives	Pit water levels Water quality Riparian vegetation	Pits nearing fixed water levels - Main Pit 58-59 mRL - Intermediate Pit 49-50 mRL Riparian vegetation decline after overtopping event	Pause pumping from SIS bores during high flows to increase capacity of WTP to treat Pit waters Increase discharge from WTP proportional to additional water entering pits Undertake de-watering of Intermediate Pit to EBFR prior to high rainfall events (cyclones) to increase beyond 'live storage' capacity Increase 'live storage' capacity	Prior to extreme rainfall event, secure equipment and stop work, remove staff. Overtopping of Intermediate Pit	Stop work in Main Pit during extreme rainfall events Increase capacity of WTP to handle additional volume Review Water Management Plan Directly release suitable water from Intermediate Pit during wet season discharge	Medium
2	Rainfall run-off from incomplete/open WRD or WSF containing AMD causing contamination leading to reduced surface water and habitat quality	Implement Erosion Sediment Control Plan (ESCP) including use of sediment dams, clean water diversion drain, sediment fences and mulching Implement Water MP, including: - managing water in sediment basins for turbidity and pH - directing surface water to WTP (if required) Implement vertical and cellular construction and deconstruction plans.	10.7.1 7.4.1 9.4.1	ESCP	Medium	Unlikely	Low	No exceedance of surface water LDWQOs	ESC Water quality as per Monitoring Table row 15 - 19 Riparian vegetation	Near overflow event within sediment basins Minor or single exceedance of LDWQOs Riparian vegetation decline after contamination event	Check sediment levels and de-silt as required Treat water quality in basin or via WTP Adjust pH within basin Discharge basin to Main Pit for inclusion in de-watering and WTP	Water quality does not respond to in-basin adjustment Major or repeat exceedance of LDWQOs Failure in basins / overtopping in events other than 5% AEP storm Significant deterioration in riparian vegetation health from baseline	Review ESCP implementation and design Direct water to WTP Review and correct construction of basins	High

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MIP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
3	First flush event creates a pulse of contamination and sedimentation that exceeds LDWQOs for a short period	Implement Water Management Plan, including: - ensuring the maximum local pit catchments are re-diverted away from Main and Intermediate Pits - operating SIS and WTP year-round to reduce AMD groundwater Implement Erosion Sediment Control Plan (ESCP) including use of sediment dams, clean water diversion drain, sediment fences and mulching	10.4.3	ESCP	Medium	Likely	Medium	No exceedance of surface water LDWQOs	ESC Water quality as per Monitoring Table row 15 - 19	Minor or single exceedance of LDWQOs	Maintenance of controls as per ESCP	Major or repeat exceedance of LDWQOs	Review ESCP implementation and design Review and correct construction of basins	High
4	Uncontrolled release, spill or discharge of hazardous materials causing water contamination and/or reducing aquatic habitat quality	Developing and implementation of site procedures for spill response Bundling/containment areas that meets AS/NZS standards for all storage of hazardous materials	3.1.1 2.6.2 9.3.3	-	Serious	Unlikely	Low	All uncontrolled releases/spills are: a) reported b) contained	Soil, groundwater and surface water monitoring relevant to the site of the uncontrolled spill Monitoring and audits of storage locations for spills or release	Spill or leak detected/reported Structural deficiency of a containment area	Contain hazardous materials and investigate cause of spill/leak Report spill to NT EPA and DAWE Repair of containment area	Detection of spill contaminants outside of containment area	Contact contaminated lands consultant to determine if any remediation actions are required	High
5	Use of PAF contaminated materials in road construction of road leading to polluted surface water run-off (and associated impacts)	Undertake geotechnical investigation of material for roads to detect contamination potential	7.8.1	-	Serious	Unlikely	Medium	n/a	n/a	n/a	n/a	n/a	n/a	High
6	Use of contaminated water for dust suppression leading to polluted surface water run-off (and associated impacts)	Test water taken from WTP outputs prior to use for dust suppression	11.3.1	-	Serious	Unlikely	Medium	n/a	n/a	n/a	n/a	n/a	n/a	High
7	Disturbance of radiological material during construction causing uncontrolled contamination of soil, dust or water (and associated impacts on habitat quality, flora and fauna)	Implement Radiation Management Plan (Rad MP)	-	Rad MP	Minor	Rare	Low	As per Rad MP	As per Rad MP	As per Rad MP	As per Rad MP	As per Rad MP	As per Rad MP	-

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
Minimise and contain erosion within site														
8	Erosion of land disturbed by construction activities leading to: - reduced surface water and habitat quality from sedimentation - loss of topsoil required for revegetation - destabilisation of landforms	Implement Erosion Sediment Control Plan (ESCP) including use of sediment dams, clean water diversion drain, sediment fences and mulching Store topsoil as per ESCP and Rehabilitation Media Stripping and Stockpiling Procedure to minimise leaching of nutrients and loss of structure Undertake staged land clearing as per Project Schedule Undertake progressive revegetation as per Reveg MP	12.3.1 9.3.1 14.4.1	ESCP Reveg MP	Medium	Possible	Medium	No exceedance of LDWQOs No visible erosion	ESC Water quality as per Monitoring Table row 15 - 19	Minor or single exceedance of LDWQOs ESC's are less than 70% effective Visible erosion	Maintenance of controls as per ESCP Rectification of eroded features	Major or repeat exceedance of LDWQOs Recurring erosion at rectified sites	Review ESCP implementation and design Review and correct construction of basins Rectification of eroded features	High
Minimise impacts to the community														
9	Increase in local traffic because of construction works reduces road safety and/or amenity	Implement the Traffic Management Plan (in development) Implement Road Use Management Plan (in development) Implement any actions deemed necessary by the regulating authority	13.2.3 15.3	Traffic MP Road Use MP	Major	Unlikely	Medium	As per Traffic MP	As per Traffic MP	As per Traffic MP	As per Traffic MP	As per Traffic MP	As per Traffic MP	See Traffic MP
Retain and improve biodiversity values on site														
10	Proliferation of feral animals impacting revegetation success	Implement the Feral Animal MP (in development)	14.1.9 17.4.1	Feral Animal MP	-	-	-	Increased feral animal presence	Camera trapping	tbc	tbc	tbc	tbc	tbc
11	Clearing riparian vegetation for river crossings, resulting in: a) erosion of banks b) impacts to water quality c) loss of significant vegetation type d) reduction aquatic habitat	Designed location for crossings do not intersect significant vegetation stands Implement Erosion Sediment Control Plan (ESCP) Undertake progressive revegetation as per Revegetation Management Plan (Reveg MP)	9.3 14.4.1	Veg CP ESCP Reveg MP	Medium	Unlikely	Low	Vegetation clearing contained within planned areas	ESC	Minor disturbance outside planned clearing area Minor or single exceedance of LDWQOs	Stop vegetation clearing until operational control is regained. Report non-conformance to Environment Manager. Investigate and remedy cause of unplanned clearing Re-vegetate cleared areas as soon as possible	Major or repeat disturbance outside planned clearing area Major or repeat exceedance of LDWQOs	Staff to undertake mediation and external training. If re-training does not solve this issues staff or contractor must not be allowed to undertake land clearing Rehabilitate and revegetate impacted areas as soon as possible Review ESCP implementation and design	High

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
12	Clearing vegetation leading to: - a loss of habitat and/or a decrease in biodiversity - land exposed to erosion (with associated impacts)	Design facilities to be located within areas of minimal impact – already cleared or disturbed as priority Survey control and mark up of approved vegetation clearing limits. Clearly marked in field on the ground as part of the Ground/Vegetation Disturbance Approval Request Do not remove or clear substantial vegetation stands within borrow pits. This is not required to achieve completion of the job. Retain islands of vegetation within borrow pits. Undertake progressive revegetation as per Revegetation Management Plan (Reveg MP)	-	Veg CP Reveg MP	Medium	Possible	Medium	Vegetation clearing contained within planned areas	All clearing activities to be directly supervised by the Superintendent or an approved nominated representative	Minor disturbance outside planned clearing area	Stop vegetation clearing until operational control is regained. Report non-conformance to Environment Manager. Investigate and remedy cause of unplanned clearing Re-vegetate cleared areas as soon as possible	Major or repeat disturbance outside planned clearing area Loss of significant vegetation type (as described in the NT Land Clearing Guidelines)	Penalty to Contractor if responsible for root cause of over clearing Staff to undertake mediation and external training. If re-training does not solve this issues staff or contractor must not be allowed to undertake land clearing Rehabilitate and revegetate impacted areas as soon as possible	Medium
13	Mortality of individual animals from interaction with construction machinery / vehicles during vegetation clearing	Implement Vegetation Clearing Procedure, including pre- and post-clearing surveys by a fauna spotter-catcher Do not remove or clear substantial vegetation stands within borrow pits. This is not required to achieve completion of the job. Retain islands of vegetation within borrow pits.	-	Veg CP	Minor	Unlikely	Low	Fauna spotter-catcher engaged for all clearing works	Pre- and post-clearing reporting as per Veg CP	Mammals, birds or large reptiles injured/killed	Increase number of fauna spotter-catchers Undertake 'blade-up' vegetation clearing	Identification of previously-unrecorded threatened species within clearance footprint	Contact DEPWS and DAWE for advice	High
14	Introduction or spread of weeds due construction activities resulting in: - reduction in habitat quality or abundance of species - reduction in ability to establish culturally-significant species - change in the character, cultural and environmental context of sacred sites and heritage values - increased fire fuel loads	Design facilities to be located within areas of minimal impact – already cleared or disturbed as priority Implementation of Weed Management Plan (Weed MP), including control, quarantine and hygiene measures	8.3.2 12.3.3 12.4.1	Weed MP	Serious	Possible	Medium	No new weed species present within site No new infestations of weeds already present on site	Weeds	Weed controls not occurring as scheduled in the Weed MP	Undertake remedial weed control (if appropriate for the season)	New weed species recorded New infestation/s of weeds already present on site	Undertake extra weed control Revise the schedule and/or priority areas/weeds within the Weed MP	Medium

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
15	Onsite fire causes loss of vegetation leading to: - exposure of land surface and increased erosion/sedimentation - reduced habitat quality - impacts on revegetation success - culturally-significant flora/heritage/sacred sites	Implement Fire Management Plan (FMP), including firebreaks and controlled burns Implement Weed MP to reduce Gamba Grass fuel load	14.3.4 8.2.6	BMP Weed MP	Serious	Unlikely	Medium	No uncontained fires generated by construction activities	Aera burnt within project areas using NAFI fire scar mapping Fire break visual inspections Weeds	Annual burns not undertaken Fire breaks are not in place or maintained Gamba Grass is prolific around work areas	Undertake annual burns (if appropriate for the season) Install/maintain firebreaks Control Gamba Grass in areas close to construction activity	Fire generated by construction activities entering revegetated areas or remnant bushland causing failure of revegetation	Review Fire MP to ensure: - firebreaks are adequate (in size and number) and maintained - annual burns are sufficient and being undertaken Review Weed MP to ensure vegetated areas close to construction activity are prioritised for control Rehabilitate / infill plant revegetation lost to fire	High
16	Revegetation is unsuccessful, leading to: - erosion (and associated impacts) - weed proliferation - reduced habitat quality	Implement Revegetation Management Plan (Reveg MP) which contain adaptive management measures Store topsoil as per ESCP and ESCP and Rehabilitation Media Stripping and Stockpiling Procedure to minimise leaching of nutrients and loss of structure	9.3.2	Reveg MP ESCP	Serious	Rare	Low	As per Reveg MP	Revegetation success	As per Reveg MP	As per Reveg MP	As per Reveg MP	As per Reveg MP Rock armour high erosive features to maintain physical and chemical stability as number 1 priority	Medium
17	Groundwater drawdown leading to reduced vegetation condition for the groundwater-dependent vine forest within the mine site	Intermediate Pit operating level set in consideration of maintaining groundwater to the vine thicket.	11.3.2	Water MP	Medium	Rare	Medium	No significant deviation in vine thicket health as per trigger criteria	Monthly vegetation water stress - NDWI using Sentinel data Photo-monitoring points	A significant deviation from baseline NDWI value (seasonally-adjusted) for three months in a row	Review groundwater extraction and pit de-watering levels If they occur, drawdown impacts will be temporary; stopping once de-watering ceases. If the level of dryness is severe, use treated water from the pit to irrigate the patch.	Long-term deviation from baseline NDWI value and/or vegetation death observed within vine thicket	Irrigate vine thicket using treated water from the WTP	High

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
Preserve heritage and cultural values														
18	Construction activities causing accidental disturbance of unknown cultural, heritage and sacred sites or objects	<p>Cultural Heritage monitors to supervise all clearing and ground disturbance activities</p> <p>Stop work immediately</p> <p>Report immediately to Project Director or Executive Director</p> <p>Contact NT Heritage Branch</p>	-	CHMP	Medium	Possible	Medium	n/a	n/a	n/a	n/a	Unidentified site / object is found outside of the conservation buffer areas.	<p>Engage the services of an appropriately-qualified archaeologist to collaborate with Indigenous Custodians to document the extent of the potential place</p> <p>Apply conservation buffer to new site</p>	High
19	Construction activities causing unauthorised disturbance of known cultural, heritage and sacred sites or objects	<p>Communicate to all staff the Aboriginal Areas Protection Authority (AAPA) requirements</p> <p>Cultural Heritage monitors to supervise all clearing and ground disturbance activities</p> <p>Signage in field to designate NO GO zones for all staff and equipment.</p> <p>Acquire Disturbance Permits for all known sites/objects that need to be disturbed or salvaged</p>	8.2.1 8.2.3	CHMP	Major	Rare	Medium	Known sites/objects are not disturbed without authority to do so	All construction activities to be directly supervised by the Superintendent or an approved nominated representative	<p>Unauthorised encroachment into conservation buffer (without physical disturbance)</p> <p>Minor disturbance outside planned clearing area</p>	<p>Revisit Cultural Heritage Induction and ensure all in breach re-take training prior to recommencing work on site</p> <p>Engage TOs and Rangers to survey the relevant conservation buffer for any physical disturbance of values</p>	Physical disturbance of known site/object without authority to do so	<p>Physical demarcation of sites (e.g. flagging) to allow for visual barrier for staff</p> <p>Staff to undertake mediation and external training. If re-training does not solve this issues staff or contractor must not be allowed to enter site</p>	High
20	Construction activities causing the loss of culturally-significant species (Darwin Cycads and Milkwoods)	<p>Record the location of culturally-significant species, then utilise in-vehicle monitoring system (IVMS) and geo-fencing to ensure they are not disturbed</p> <p>Salvage and transplant cycads as per the Cycad Salvaging Procedure</p>	8.2.5 14.4.1	Cycad SP	Serious	Possible	Medium	<p>No clearing of flagged culturally-significant species</p> <p>High (80%) survivorship of transplanted cycads</p>	Success of translocated culturally significant cycads	<p>Loss of a few flagged culturally-significant species</p> <p>Less than (80%) survivorship of transplanted cycads</p>	<p>Revisit Cultural Heritage Induction and ensure all in breach re-take training prior to recommencing work on site</p> <p>Seek advice from a native plant expert regarding mortality of transplanted cycads</p>	Loss of a many flagged culturally-significant species in a single event or a few such species over multiple events	<p>Physical demarcation of sites (e.g. flagging) for a visual sign for staff</p> <p>Staff to undertake mediation and external training. If re-training does not solve this issues staff or contractor must not be allowed to undertake land clearing</p>	High
Relevant to all management objectives														

No.	Risk to Management Objective	Management Measures	EIS Reference	Relevant MP	Residual Consequence	Residual Likelihood	Residual Risk of Impact	Performance Indicator	Monitoring Activity	Trigger Criteria	TARPs	Threshold Criteria / Stop Work	Corrective Action	Likelihood of Activity achieving Objective
21	Deposition of dust generated by construction activities leading to: - loss of amenity or disturbance of heritage, cultural and sacred sites - reduced success of revegetation - reduced habitat quality	<p>Implement dust mitigation procedures such as</p> <ul style="list-style-type: none"> - using water spray carts on unsealed surfaces - setting road speed limits on unsealed surfaces - undertaking topsoil stripping only during suitable wind conditions - dust minimisation treatment of external haul roads (e.g. primer sealing on dirt roads) - reducing construction activity during high wind events - potential temporary relocation of resident at Mt Burton during works <p>Undertake staged land clearing as per Project Schedule</p> <p>Undertake progressive revegetation as per Revegetation Management Plan (Reveg MP)</p>	8.2.8 15.3.2 15.4.2 9	Reveg MP	Serious	Rare	Medium	No visible dust deposition on vegetation	<p>Visual inspections of dust during construction</p> <p>Revegetation success</p>	<p>Excessive visible dust</p> <p>Dust complaint received from resident / public</p> <p>Dust deposition on vegetation</p>	<p>Commence dust deposition monitoring</p> <p>Increase water spraying in problematic areas</p> <p>Reduce the rate of constructions works / haulage on days with poor background air quality.</p> <p>Limit the amount and frequency of material transported</p> <p>Stabilised cleared areas that are not being actively work on</p> <p>Ensure revegetation works are proceeding as per schedule in Revegetation MP</p>	<p>Repeat dust complaints from public</p> <p>Deposition of > 4/g/m²/month</p>	<p>Cease all operations for specified range of meteorological conditions / high dust generating weather</p> <p>Increase levels of water sprayed</p> <p>Use of chemical suppressants where higher efficiencies are required</p>	High

Appendix B Monitoring Schedule

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
1	QA/QC	During construction	Groundwater bores adjacent to Main Pit	pH, EC and water levels	RN22107, RN22544	Weekly	To be established	Sample bores and analyse for sulphates to determine if surface water from Main Pit backfill is migrating into surrounding groundwater aquifer. Investigate conformance to operational water levels in the Main Pit. Escalate requirement for response plan to the Project Director.
2	QA/QC	During construction	Groundwater SIS (abstract and treat)	Water level	All Groundwater SIS bores	Daily	n/a	Not Applicable - the purpose is to collect data to understand the rates of Cu desorption and quality improvement (remediation performance) within the existing impacted groundwater plumes, and to monitor aquifer drawdown.
3	QA/QC	During construction	Groundwater SIS (abstract and treat)	Water quality*	All Groundwater SIS bores	Weekly	n/a	Not Applicable - the purpose is to collect data to understand the rates of Cu desorption and changes in quality within the existing impacted groundwater plumes.
4	QA/QC	During construction	Sediment ponds - WSFs	Mud level	To be established during operations	Daily	To be established	Visual inspection of level. Clean out if upper levels triggered.
5	QA/QC	During construction	Sediment ponds - WSFs	pH, EC, turbidity	To be established during operations	Daily	To be established	Neutralise in situ or send to WTP for treatment prior to discharge.
6	QA/QC	During construction	Water Treatment Plant	Flow rate to EBFR	WTPO	Automated, continuous	n/a	Not Applicable - the purpose is to collect dataset to understand local flow conditions throughout operations. Data to be used in relation to investigating impact to downstream environs and reporting where required.
7	QA/QC	During construction	Water Treatment Plant	Volume (cumulative)	WTPO	Automated, continuous	n/a	Not Applicable - the purpose is to collect dataset to understand local flow conditions throughout operations. Data to be used in relation to investigating impact to downstream environs and reporting where required.
8	QA/QC	During construction	Water Treatment Plant	WTP discharge quality	WTPO	Automated, continuous	LDWQOs	Cease discharge and investigate non-conformance.
9	QA/QC	During construction	Water Treatment Plant	Field pH, EC, alkalinity, turbidity	WTPO	Daily through commissioning, then rely on in-line automated monitoring	To be established	Trigger sampling for external analysis of same parameters. Determine if additional test work is required from external laboratory. Investigation into causes. Cease discharge to EBFR until stabilised and within range.
10	QA/QC	During construction	Water Treatment Plant	Water quality*	WTPO	Weekly on commissioning, shift to monthly when stabilised	n/a	Not applicable - the purpose is to collect dataset to understand local flow and quality conditions throughout operations. Data to be used in relation to investigating impact to downstream environs where required.

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
11	QA/QC	During construction	Main pit backfilling	Water quality*	Main Pit	Weekly during backfill		
12	QA/QC	During construction	Main pit backfilling	Water level	Main Pit	Weekly during backfill	58-59mRL	Needs text
13	QA/QC	During construction	Main pit backfilling	Water quality*	Intermediate Pit	Weekly during backfill	As per WDL	
14	QA/QC	During construction	Main pit backfilling	Water level	Groundwater monitoring point - Intermediate Pit	Weekly during backfill	49-50mRL	Needs text
15	QA/QC	During construction	Main and Intermediate Pit	Water quality*, pH, temperature, EC	Main and Intermediate Pit surface Intermediate Pit outflow	Monthly in dry Two weekly in wet	LDWQOs	Water to be treated in WTP prior to discharge
16	QA/QC	During construction	Groundwater Bores	Pumping rates	SIS and recovery bores	Continuous	No flow	Investigate cause of groundwater drawdown and rectify
17	QA/QC	During construction	Groundwater Bores	Water level	SIS and recovery bores	Monthly	Deviation from modelled predictions / normality	Investigate cause of groundwater drawdown and rectify
18	QA/QC	During construction	Groundwater Bores	Water quality*	SIS and recovery bores	Quarterly	Deviation from modelled predictions / normality	
19	QA/QC	During construction	Groundwater Bores	Water quality*	All existing bores	Monthly in dry Two weekly in wet	n/a	n/a
21	QA/QC	During construction	Waste rock and AMD	Lime dosing of every block	WRD, WSF	Ongoing	pH 7	Needs text
22	QA/QC	During construction	EBFR channel	Channel vegetation and stability	EBFR re-alignment	After construction of re-alignment	Needs text	Needs text
23	QA/QC	During construction	WSF Cover	As per table 'Appendix C - Soil Cover Program and Associated C Factors' in Appendix 10. SLR 2020a	WSF	3 times in wet season in year one. End of season (twice annually)	As per table 'Appendix C - Soil Cover Program and Associated C Factors' in Appendix 10. SLR 2020a	Needs text
24	QA/QC	During construction	WSF Cover	Erosion and sediment movement - field inspection	WSF	Years 7 - 20, provided vegetation has achieved 90% cover. Annually	Deviation from modelled predictions / normality	Immediate investigations to identify root causes of failure to design and implement appropriate maintenance works as early as possible.

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
25	QA/QC	During construction	WSF Cover	Erosion and sediment movement - DEM (LIDAR) checks	WSF	Years 7 - 20, provided vegetation has achieved 90% cover. 4 yearly	Deviation from modelled predictions / normality	Immediate investigations to identify root causes of failure to design and implement appropriate maintenance works as early as possible.
27	CEMP	During construction	Groundwater bores adjacent to Main and Intermediate Pits	Water level	RN22107, RN22544, RN37722, RN37719, RN37727, RN23516, RN23517, RN23518	Weekly	n/a	Not Applicable - the purpose is to collect a dataset to understand localised drawdown. Data to be used in relation to investigating impact to the nearby vine thicket, as well as drawdown impact on EBFR groundwater (if any).
28	CEMP	During construction	Project area	Weed species and distribution	Borrow areas, roadsides, active construction areas, topsoil stockpiles	Monthly	Weed control not occurring as scheduled in Weed MP	Undertake remedial weed control (as appropriate for the season)
29	CEMP	During construction	Project area	Firebreaks	Borrow areas, roadsides, active construction areas, topsoil stockpiles	Monthly	Fire breaks not maintained	Maintain fire breaks/fuel loads in accordance with Bushfire Management Plan.
30	CEMP	During construction	Vegetation clearing	As per vegetation clearing procedure	Vegetation clearing areas	As required	Minor disturbance outside planned clearing area	Stop vegetation clearing until operational control is regained. Report non-conformance to Environment Manager. Check accuracy and usage of IVMS Investigate and remedy cause of unplanned clearing Re-vegetate cleared areas as soon as possible
31	CEMP	During construction	Revegetation	Success of translocated culturally-significant cycads	Re-location areas	As required	Less than 80% survivorship of translocated plants	Check accuracy and usage of IVMS Revisit Cultural Heritage Induction and ensure all in breach re-take training prior to recommencing work on site Seek advice from a native plant expert regarding mortality of transplanted cycads
32	CEMP	During construction	Nuisance dust	Visual inspections and monitoring of construction activities	All active areas	Continuous	Excessive visible dust Dust complaint received from resident / public Dust deposition on vegetation	Commence dust deposition monitoring Increase water spraying in problematic areas Reduce the rate of constructions works / haulage on days with poor background air quality. Limit the amount and frequency of material transported Stabilised cleared areas that are not being actively work on Ensure revegetation works are proceeding as per schedule in Revegetation MP Ensure dust suppression is managed under contractor's site environmental management plan/traffic management plan. Stop work during high dust generating weather conditions. Inform Environment Manager/Construction Manager of excessive dust.
33	CEMP	During construction	Nuisance dust	Dust deposition gauge	R3 (Mt Burton), R8, R10.	Monthly	TBC	Report exceedance to Environment Manager.
34	CEMP	During construction	Hydrocarbons storage and re-fuelling areas	Visual inspection of storage and re-fuelling areas	To be established during operations	Daily for spills and leaks	Spills or leaks detected	Rectify and remediate spills and leaks.

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
35	CEMP	During construction	Water released from sediment basins	Water quality*	ESC devices, sediment dams	Prior to any controlled release of water	LDWQOs pH 7 TSS	If water does not meet LDWQOs, flocculation or pH dosing applied onsite or send to WTP for treatment
36	CEMP	During construction	Plant and equipment inspections	Weed seed and material free	On arrival to site	As required	Presence of contaminants, weed seed or materials	Cleaning of vehicle, plant or equipment prior to entry to site as per Weed MP
37	CEMP	During construction	Fire scars	Area burnt using NAFI fire scar mapping	Project area	Annually	Fire entering revegetated areas causing failure of revegetation	Review Fire MP Rehabilitate/infill plant lost revegetation Review Weed MP
38	CEMP	During construction	Movements within site	VMS for entrance and/or disturbance to restricted work areas or buffer zones as per CHMP	Project area	Ongoing	Non-conformance with CHMP restricted work areas and buffer zones	Stop activity until operational control is regained. Report non-conformance to Environment Manager and archaeologist.
39	CEMP	Pre & During construction	Vine thicket health	Vegetation water stress (Normalised Difference Water Index using Sentinel data)	Entire vine thicket patch	Monthly	A significant deviation from baseline NDWI value (seasonally-adjusted) for three months in a row	Review groundwater extraction and pit de-watering levels. If they occur, drawdown impacts will be temporary; stopping once de-watering ceases. A drier patch will be more susceptible to fire and weeds; however, that will be mitigated by the weed and fire control that will be undertaken during the entire works phase of the project. If the level of dryness is severe, it may be possible to use treated water from the pit to irrigate the patch.
40	Both	During construction	Main Pit Operational Water Levels	Water level	MPO	Automated, continuous	58-59mRL	If under 58mRL, cease pit dewatering until water level is recovered. If over 59mRL, cease pit backfilling until water level is recovered. In a high rainfall event, stop groundwater recovery SIS and focus all water treatment effort on surface waters. Increase discharge from WTP proportional to additional water entering pits. Undertake de-watering of Main Pit to Intermediate Pit
41	Both	During construction	Intermediate Pit Operational Water Levels	Water level	IPO	Automated, continuous	49-50mRL	If over 50mRL, cease pit backfilling until water level is recovered. If under 49mRL, cease drawing from Intermediate Pit until water level is recovered. In a high rainfall event, switch off groundwater recovery system and focus all water treatment effort on surface waters.

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
42	Both	During construction	Downstream EBFR Zones 2 and 6	Water quality*	EBdsRB	Monthly	LDWQOs	Proposed WDL compliance point. Report exceedance to DENR if three sequential triggers in any season. Investigation into WTP operations or if legacy water quality impacts. Investigation into downstream water quality post high-rainfall event that overtops the Pit control system and if deemed necessary by the project aquatic ecologists.
43	Both	During construction	Downstream EBFR Zones 2 and 7	Visual inspection - downstream erosion (qualitative)	EBdsRB	Quarterly	Significant erosion	Investigation into cause of bank erosion. Commence quantitative monitoring as directed by project geomorphologist.
44	Both	During construction	Downstream EBFR Zones 4 to 6	Water quality*	EBusFR, FRusEB, FRusFC, FRdsFC	Quarterly	LDWQOs	Investigation to determine if changes driven by mobilisation of legacy sediments or from the rehabilitation operations.
45	Both	During construction	Revegetation	Qualitative progressing to quantitative (Landscape Function Analysis and survey)	All revegetation areas	At 18 months and 3 years	Notable poor performance	Investigate cause of poor performance and enact remedial works based on findings.
46	Both	During construction	Revegetation	Qualitative progressing to quantitative (Landscape Function Analysis transects and survey)	All revegetation areas	Within 6 months of seeding/planting. 2-3 years 5-8 years	Notable poor performance	Investigate cause of poor performance and enact remedial works based on findings.
47	Both	During construction	Downstream EBFR Zones 2 and 3	Water quality*	EBFR from Dyson's area to GS200	Weekly	LDWQOs	Needs text
48	Both	During construction	Downstream EBFR Zones 2 and 3	Water quality*	EB@GS327 EB@GS097	Monthly (when flows present)	LDWQOs	Needs text
49	Both	During construction	All ESC structures and stockpiles	Condition of structures, evidence of overflow, water colour, eroding surfaces, retained capacity, silt levels.	To be established during operations	Weekly (December to April) Monthly (May to November) Following significant rainfall events (i.e. > 15mm in 24hr period)	Visible erosion ESC not operating as designed	Maintenance as per ESCP
50	Both	During construction	Water management structures and vegetation cover	Visual inspection	To be established during operations	Monthly or following heavy rainfall events (i.e. > 15mm in 24hr period)	Visible erosion Unstable landform Water-pooling	Report failure of landform or vegetation to Environmental Manager
51	Both	During construction	Road drainage works	Erosion and sediment movement	To be established during operations	Quarterly or following heavy rainfall events (i.e. > 15mm in 24hr period)	Visible erosion	Maintenance as per ESCP

No.	CEMP or QA/QC	Timing	Element / location	Parameter	Location	Frequency	Trigger Levels	Trigger Action Response Plan (TARP)
52	Both	During construction	WSF Cover	Erosion and sediment movement - field inspection	WSF	First 7 years until vegetation establishment has achieved minimum 90% soil cover. 6 monthly and/or after storm events	Deviation from modelled predictions / normality	Immediate investigations to identify root causes of failure to design and implement appropriate maintenance works as early as possible.
53	Both	During construction	WSF Cover	Erosion and sediment movement - DEM (LiDAR) checks	WSF	Years 3.5 and 7	Deviation from modelled predictions / normality	Immediate investigations to identify root causes of failure to design and implement appropriate maintenance works as early as possible.
54	Both	Pre & During construction	Downstream EBFR Zones 2 and 3	Flow rate, pH, EC, turbidity	EB@GS200, EB@GS327, EB@GS097	Continuous at gauge	TBC	Not applicable - the purpose is to collect dataset to understand local flow and quality conditions throughout operations. Data to be used in relation to investigating impact to downstream environs where required.
55	Both	Pre & During construction	Downstream EBFR Zones 2 and 4	Field pH, EC	EBdsLB	Weekly	TBC	Investigation into cause of variation against trigger levels. Commence additional monitoring if required. Report variation internally to Project Director. If three sequential triggers in dry season, report variation to DENR case officer.
56	Both	Pre & During construction	Downstream EBFR Zones 2 and 5	Water quality*	EBdsLB	Monthly	LDWQOs	Investigation into WTP operations or if legacy water quality impacts. Investigation into downstream water quality post high-rainfall event that overtops the Pit control system and if deemed necessary by the project aquatic ecologists.
57	Both	Pre & During construction	Riparian vegetation monitoring	Riparian vegetation condition	Minimum 21 sites See EIS 12.4.1 for details	Twice per year, seasonally	Needs text	Needs text
58	Both	Pre & During construction	Aquatic macrophytes	Presence / absence Total area of macrophyte-bed within 100m stretch of river at each monitoring site	As riparian sites	Twice per year, seasonally	Needs text	Needs text

* - water quality as per Table 2.2 in SEIS Appendix 1. Draft Monitoring Plan

~~Appendix D~~ Appendix C EPBC Reporting Template

~~Appendix E~~ Appendix D Clearing boundaries (coordinates)

Appendix E EPBC Guidance checklist and reference

EPBC Guidance	CEMP Reference
1. Include a declaration of accuracy (attached) signed by the approval holder upon finalisation of the plan (prior to approval).	Page iii
2. Include an introduction which outlines the plan's purpose and provides contextual information including: <ol style="list-style-type: none"> a. location and nature of approved action activities; b. a schedule of approved action phases (e.g. commencement, construction, operation and decommissioning); c. information on protected matters, including 'baseline' environmental condition; d. location of protected matters (and/or their habitat) in relation to the approved action boundary; and e. management objectives relevant to protected matters and strategies to manage key risks to achieving those objectives 	Chapter 1 Chapter 2 Chapter 4.2
3. Include a table that: <ol style="list-style-type: none"> a. lists all EPBC Act approval conditions relevant to the plan; b. demonstrates how the plan addresses approval condition requirements and intended outcomes for protected matters; and c. references sections and pages of the plan where addressed. 	Chapter 3
4. Set out 'Performance standards' developed in accordance with SMART ¹ criteria that will evidence achievement of management objectives. 'Performance standards' must include: <ol style="list-style-type: none"> a. performance indicators, which are used to measure performance against a management objective, and are usually specific physical, chemical or biological parameters that can be measured to represent environmental health or condition; b. performance criteria², which are the numerical values for a <i>performance indicator</i> and may be set at: <ol style="list-style-type: none"> i. an acceptable level beyond which there is likely to be an unacceptable impact to protected matters (threshold criteria), and if breached may require corrective actions³; ii. a level or multiple levels to forewarn of the approach of an unacceptable impact to protected matters (trigger criteria⁴), and if breached will require mitigation activities (trigger action response plan) to avoid realisation of that impact; and iii. a level to achieve and maintain a particular management objective (completion criteria). 	Chapter 4 Chapter 5 Appendix A
5. Assess the risks to achieving the plan's objectives and identify strategies for managing those risks. Therefore the risk assessment must: <ol style="list-style-type: none"> a. identify events that prejudice attainment of 'performance standards'; 	Chapter 6 Appendix A

¹ Specific, Measurable, Achievable, Relevant and Time bound

² May also be referred to as a *performance target*

³ May also be referred to as *contingency/remedial action or response*

⁴ May also be referred to as *trigger value or trigger*

EPBC Guidance	CEMP Reference
<ul style="list-style-type: none"> b. assess the likelihood and consequence of those events and characterise residual risk levels (assuming management activities will be implemented); c. apply a 'margin of safety' where uncertainty is high (e.g. enhance monitoring and management activities until uncertainty is reduced to an acceptable level); d. specify measurable circumstances (trigger criteria) that detect (through monitoring) actual or potential issues in a timely manner, to avoid unacceptable impacts through additional management activities (trigger action response plans or TARPs); e. include a 'stop work' response if TARPs are not effective; and f. specify a range of effective corrective actions that may be implemented as a result of unacceptable (project attributable) impacts to protected matters. 	
<p>6. Specify management activities that will be implemented to ensure the plan's 'performance standards' are met. Each management activity must:</p> <ul style="list-style-type: none"> a. include timeframes for implementation; b. be related to meeting 'performance standards'; and c. be derived from recognised principles, practice, or guidelines, and be justified - technically, scientifically and/or legally (e.g. by recommendation in a EPBC Act protected matter conservation advice, recovery plan and threat abatement plan). 	Chapter 5 Appendix A
<p>7. Include an adaptive management and review program to ensure uncertainty is reduced over time, and 'performance standards' are efficiently met. The program must:</p> <ul style="list-style-type: none"> a. allow for frequent review of the effectiveness of management activities with high levels of uncertainty; b. ensure new information is collected and incorporated into the plan, as a result of implementing the plan or from external sources (e.g. literature, EPBC Act policy statements); c. include a schedule and triggers for internal auditing of the plan's implementation and its effectiveness in meeting 'performance standards'; and d. allow for periodic review and technical evaluation (i.e. by an ecologist or similar expert), and revision of the plan: <ul style="list-style-type: none"> i. according to approved timeframes; ii. in response to changing circumstances; and iii. to address learnings from implementing corrective actions and/or TARPs. 	Chapter 7
<p>8. Include a monitoring program adequate to meet decision-making, inform adaptive management, and to demonstrate 'performance standards' have been, or are likely, to be met. The monitoring program should therefore:</p> <ul style="list-style-type: none"> a. engage qualified persons to design and conduct monitoring, and to analyse monitoring data; b. provide quantitative (e.g. on-ground survey results) and qualitative (e.g. photo-point monitoring sites) data that establish the 'baseline' environmental condition for the protected matters within the approved action boundary; c. provide data from 'benchmark' or reference sites outside the approved action boundary (where relevant); d. describe monitoring methods that will be implemented (including monitoring area/site selection, sampling intensity over space and time) and statistical analyses to be employed; 	Chapter 7.2

EPBC Guidance	CEMP Reference
<p>e. justify monitoring methods, including through an assessment of effectiveness and constraints (e.g. is monitoring consistent with relevant Commonwealth, State or Territory guidelines; does it account for seasonal and climatic variability; is it statistically powerful; is it capable of detecting change in environmental condition due to management interventions?).</p>	
<p>9. Include a program for handling and storing information/data for the purpose of reporting, publishing and auditing in accordance with conditions of the approval (e.g. for compliance purposes).</p>	Chapter 7.4
<p>10. Include a program to report on plan implementation. The program must:</p> <ul style="list-style-type: none"> a. Identify EPBC Act approval reporting obligations and how those obligations will be met; b. Include reporting template/s; and c. include a schedule and triggers for reporting types (e.g. annual compliance, environmental incidents and non-compliance). 	Chapter 7.3 Appendix C
<p>11. Specify roles, responsibilities and accountabilities for implementing various aspects of the plan.</p>	Chapter 8
<p>12. Ensure maps and diagrams used:</p> <ul style="list-style-type: none"> a. show the project area in a State/Territory and regional context; b. are clearly legible when printed on A4; c. show areas with differing environmental condition or habitat quality, protected areas, management zones and buffer or 'no-go' zones'. This excludes sacred sites and Restricted Work Areas (RWAs) which the Aboriginal Areas Protection Authority have advised are confidential and should not be made publicly available under Section 48 of the Information Act 2002 (NT) and Section 38 of the Northern Territory Aboriginal Sacred Sites Act 1989 (NT). In such cases, appropriately redacted versions of maps may be used for wider distribution; d. show the location (or general location) of monitoring plots and management activities that will be undertaken, and are scaled to enable the reader to clearly identify local landmarks (e.g. fences, tracks, buildings) e. include a legend, metric graphic bar scales, north point, local grid lines and a title block showing: EPBC Act number; project name; author; datum; scale (e.g. 1:25 000); source and date of data/imagery. 	Noted
<p>13. Reference scientific, legal or other claims or statements that support the effectiveness of the plan (e.g. literature, published guidelines, legislation, conservation advice, recovery plans and threat abatement plans).</p>	Chapter 9
<p>14. Avoid unambiguous commitments. Use 'will' and 'must' when committing to actions, instead of: 'where possible'; 'where practicable'; 'as required'; 'to the greatest extent possible'; and 'should' or 'may'.</p>	Noted
<p>15. Include a glossary of terms comprised of: acronyms; terms open to different interpretations; not in common use; and technical or defined in the approval conditions.</p>	Glossary, page ii