ntepa Northern Territory Environment Protection Authority

TERMS OF REFERENCE FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

ROPER VALLEY IRON ORE PROJECT

NORTHERN TERRITORY IRON ORE PTY LTD

November 2017

AMD	Acid and metalliferous drainage
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Research Management Council of Australia and New Zealand
CHMP	Cultural Heritage Management Plan
EIS	Environmental Impact Statement
EL	Exploration Lease
EMP	Environmental Management Plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESIA	Economic and Social Impact Assessment
ISO	International Standards Organisation
MRCP	Mine Closure and Rehabilitation Plan
NOI	Notice of Intent
NT EPA	Northern Territory Environment Protection Authority
OGV	Ocean going vessel
SIMP	Social Impact Management Plan
SOCS	Site of Conservation Significance
Rejects	Mineralised processing waste derived from ironstone material

1 Introduction

Northern Territory Iron Ore Pty Ltd (the Proponent) is proposing the Roper Valley Iron Ore Project (the Project), located approximately 420 km south-east of Darwin and 150 km east of Mataranka.

The Project proposes the production of saleable iron ore using open cut mining methods and beneficiation, specifically from Deposits C (EL24101), W and X (EL24102). Iron ore would be transported to a purpose-built barge loading facility located near the mouth of the Roper River and then transhipped by barges to ocean going vessels (OGV) moored offshore in the Gulf of Carpentaria.

The Project has the potential to produce 150 – 300 million tonnes of marketable iron ore (56 – 58% Fe) over a period exceeding 20 years. The Project includes several components:

- mining of iron ore from open pits (3 - 10 pits) within mining areas situated south of the Roper Highway on Exploration Licences EL24101 (Deposit C) and EL24102 (Deposits W and X). The footprint of the proposed mining component is approximately 2500 hectares
- processing (screening, crushing and beneficiation) of iron ore
- a purpose-built barge facility located 15 km upstream from the Roper River mouth with a footprint of approximately 100 hectares
- transport of iron ore product from the three mining deposits along up to 235 km of upgraded public roads to the barge facility from which it will be barged approximately 40 km offshore in the Gulf of Carpentaria for transhipment to ocean going vessels.

The Project has an estimated maximum annual water requirement of 2000 million litres (ML). The proponent will investigate water source options including extraction from the Roper River and the harvest of surface waters from dams.

1.1 History

The Project is related to the previously assessed and authorised action referred to as the Sherwin Creek Iron Ore Project, in which Sherwin Iron Pty Ltd, the previous tenement holders, proposed to mine direct shipping ore using open cut methods from Deposit C of the Sherwin Creek Mining Area (MLA29584) and haul the ore via the Roper and Stuart highways to Darwin Port for export. While the Project includes mining of the approved Deposit C, Deposits W and X were not assessed as part of the Sherwin Creek Iron Ore Project Environmental Impact Statement (EIS). The existing authorisation for Deposit C does not encompass all elements of the Project proposed in the Proponent's Notice of Intent (NOI), specifically:

- the inclusion of ore processing to upgrade lower grade ores to saleable quality by crushing and screening followed by one or a combination of gravity, magnetic or sizing particle separation techniques to separate iron ore minerals from gangue minerals
- an increase in production rate from 3 million tonnes per year (Mtpa) to up to 10 Mtpa
- an increase in water requirements from 90 million litres per year (ML/a) to up to 2000 ML/a

- transportation of iron ore product by truck via existing, but upgraded, public roads to a new iron ore product stockpile and barge facility at Port Roper
- transhipment of iron ore products by shallow draft barges from Port Roper to OGVs moored in deep water in the Gulf of Carpentaria
- mining at Deposit W and Deposit X using similar open pit mining techniques.

The Proponent acquired Sherwin Iron's assets and the Deposit C site is currently in Care and Maintenance.

The Project was referred to the Australian Government Department of the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and on the 29 June 2017 the Project was determined to be controlled action, the relevant controlling provisions being:

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

The Proponent submitted a NOI for the project on 23 March 2017. On 20 July 2017 the Northern Territory Environment Protection Authority (NT EPA) decided the project required assessment at the level of an EIS. The NT EPA decision was based on a preliminary review of the Proponent's NOI, which identified the following preliminary environmental factors that could be impacted:

- benthic communities and habitat within areas recognised for conservation significance such as the Roper River, Limmen Bight Marine Park and the Limmen Bight Site of Conservation Significance (SOCS), which supports a number of EPBC Act listed species and is considered one of the most important areas for dugong and migratory shorebirds in the Northern Territory
- marine flora and fauna, including at least four species of marine turtles, pipefish species and dugong listed under the EPBC Act, potentially directly impacted by transport of ore through collision with vessels, light and noise disturbance, and disturbance to the water column. Increased particulate matter on mudflats or in the water column from dust and spills could impact the hunting or foraging ability of some fauna, including migratory shorebird species
- marine environmental quality as a result of increased sediment load from the construction and operation of the barge facility, iron ore product spills during barge/ship loading, deposition of dust into the water column and hydrocarbon spills
- terrestrial flora and fauna, including the Gouldian Finch, potentially impacted by loss of habitat and habitat degradation, and through potential interaction with vehicles
- landform changes through the formation of pits and waste dumps/piles, possible construction of dams, and through sedimentation and erosion
- hydrological processes as a result of harvesting and/or extracting surface water flows. There is uncertainty around water sources for the Project
- inland water environmental quality as a result of decreased flows and reduction in water quality through erosion, increased turbidity and spills of hazardous substances. There is uncertainty around the potential for production of acidic and metalliferous drainage

- aquatic ecosystems as a result of changes to hydrological processes and inland water environmental quality, through loss of flow, shrinkage of waterholes and changes in water chemistry during the Dry season
- air quality from dust produced by mining and transport of ore
- social, economic and cultural surroundings due to the Project's location in a remote region with significant cultural and conservation values and land uses, as well as the Project's significant water requirement and operation in areas accessible to the general public.

The proposal is being assessed under the Environmental Assessment Bilateral Agreement between the NT and Commonwealth Governments. These Terms of Reference have been developed to assist the Proponent in preparing an EIS for the Project, in accordance with clause 8 of the Environmental Assessment Administrative Procedures.

2 Description of the project

2.1 General information

The EIS should identify all the processes and activities intended for the Project and associated ancillary activities, during the life of the Project. The EIS should establish the context of the Project, including, but not limited to, the following information:

- the title of the Project and EPBC number
- the full name, contact details and postal address of the Proponent
- the location of the Project in the region and its proximity to:
  - landmark features
  - sites of cultural significance
  - sites of social significance
  - regional community centres
  - areas on the National Reserve System
  - sensitive environments, such as waterways, significant groundwater resources, significant natural features and conservation reserves
- the location of Project infrastructure (both existing and proposed) in relation to existing nearby public and private infrastructure, such as roads, airstrips, bores, dams etc.
- the background to the development of the Project, including discussion of previous environmental impact assessment and overview of historic mining activities
- the current status of the Project and the site
- an explanation and outline of the objectives, benefits and justification for the Project
- identification of areas under exploration that may be mined in future, or any other potential future activities being planned
- how the Project relates to any other proposals or actions, of which the Proponent should reasonably be aware, that have been or are being undertaken, or that have been approved in the region
- details of the Proponent's environmental record, including:

  - details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Proponent, and details of systems and processes that have been subsequently upgraded
  - any international or national accreditations (e.g. ISO 14001), environmental awards or other recognition for environmental performance
  - details of the company's environmental policy and planning framework
- national, state and/or Territory standards, codes of practice and guidelines relevant to the Project
- the consequences, both positive and negative, of not proceeding with the Project.

2.2 Project components

The EIS should identify all the processes and activities intended for the Project and associated ancillary activities, during the life of the Project. As background to discussion of specific components, the following should be included:

- the current status of the Project
- an overview of the life-of-mine schedule for the Project phases:
  - construction
  - operations
  - rehabilitation
  - decommissioning and closure
- an outline of the geology of the area, including:
  - major geological units and properties of the Project area
  - the extent and characterisation of:
    - the mineral resource
    - orebody
    - waste rock
- delineation of the Project footprint using detailed maps and diagrams, including:
  - existing infrastructure and mine components
  - existing water extraction points and storage facilities
  - mineral resources to be explored, developed, mined and included in mine rehabilitation and closure activities
  - all areas to be cleared or disturbed, both temporarily and for the life-of-mine
  - the location of any works to be undertaken, structures to be built or elements of the Project, including but not limited to:
    - mine pits
    - barge facility and barge/s
    - transhipment facility and ocean going vessel/s
    - roads (new and existing)
    - accommodation villages and construction camps

- hardstands
- stockpiles
- waste rock dumps
- processing plant
- process reject storage facilities
- water-related infrastructure, including:
    - water extraction points
    - storage facilities
    - pipelines.

2.2.1 Mining

Provide details of the following aspects of mine construction:

- a schedule and procedures for clearing and preparation of the site, including handling/stockpiling/management/ disposal of vegetation and topsoil
- methods for open pit construction
- volumes of materials required to support the operation of the mine
- plant and machinery required
- design details and dimensions or design concepts for the:
    - open pits
    - waste rock dumps
    - rejects storage
    - run of mine pad
    - mine access and haul roads
    - explosives and detonator magazines
    - product and other stockpiles
    - other significant mine infrastructure.

Provide details of the following aspects of mine operation:

- type (e.g. cut-off grades), storage and management of the stockpiled materials (e.g. top soil, waste rock etc.)
- quantity of material to be mined annually, including any proposed ramping up of production or staging of development.

2.2.2 Ore processing

Provide relevant information with respect to processing, including but not limited to:

- transport of materials to the processing facility
- processing methods, including the major equipment to be used in the various ore processing unit operations
- volumes of materials required
- water requirements, sources and treatment

- storage requirements for process water
- alternative processing methods that have been investigated and justification for the proposed option.

2.2.3 Rejects

Provide the following information on the process rejects storage facility:

- the anticipated quantity of rejects that would be produced and managed from the Project
- rejects composition and properties
- proposed geotechnical characteristics of the storage facility including permeability and any requirement for liners.

2.2.4 Waste rock characterisation

In accordance with the NT EPA's *Environmental Assessment Guideline on Acid and Metalliferous Drainage*[1], provide sufficient characterisation to enable assessment of whether the proposed mining operation has potential to produce acid and/or metalliferous drainage (AMD) or other contaminants or materials that present risks to the environment and/or public health.

2.2.5 Non-mineral waste and hazardous materials

Describe the potential sources and proposed methods for disposal of non-mineral waste and the management of hazardous materials, including:

- descriptions of predicted waste streams, both industrial and domestic, including solid and liquid wastes at the mine site, accommodation facilities and other relevant locations
- information on potentially hazardous materials to be used or produced and methods for storage, transport, handling, containment, disposal and emergency management of these materials (including fuel). Provide the Safety Data Sheets and environmental toxicity data and biodegradability for raw materials and final products
- the proposed size and construction details for landfill, and the wastes likely to be deposited in landfill
- legislation, guidelines, and standards applicable to the Project's landfill, sewage treatment and any other waste disposal facilities, such as the NT EPA's *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT*, the Department of Health's guidelines for *Requirements for Mining and Construction Projects*, and the *Code of Practice for Small On-site Sewage and Sullage Treatment Systems*.

2.2.6 Transport

Describe the proposed methods and routes for transporting and exporting product (road, barge and ocean going vessel), including:

- product handling requirements
- storage and laydown areas

[1] http://www.ntepa.nt.gov.au/__data/assets/pdf_file/0005/349934/guideline_assessment_acid_metalliferous_drainage.pdf)

- transport and export alternatives, and justification for the proposed option.

Provide relevant information with respect to the road network and any access track construction or upgrade, including:

- the sections of road proposed to be upgraded and/or sealed
- maximum width of road corridors required for construction and operation
- vegetation clearing methods and disposal of plant matter following clearing
- methods for crossing sensitive areas, such as waterways and/or land units with poor soil recovery potential and if there will be any alteration to local water flow patterns
- methods for intersecting linear infrastructure and major roads
- source of construction inputs and materials for bulk earth works
- ongoing provisions for road and access track repairs and maintenance, including source and extraction of maintenance inputs and materials.

Details of road use associated with the Project should be provided, including:

- type, size and number of vehicles required during all phases of the Project
- estimated frequency of Project-related vehicle use on public roads
- the annual or seasonal operational period
- hours of operation, including peak user times
- arrangements regarding the condition of the road at the end of each annual operating period and / or the beginning of each Wet season, and at the completion of the Project or closure of the operation by the Proponent.

Provide conceptual design and outline construction and operational activities at the barge facility and barge route to the OGV mooring including:

- bathymetry along the entire route
- type, size, draft and number of vessels required during all phases of the Project
- estimated frequency of Project-related vessel journeys
- hours of operation
- sources and quantities of materials used for construction
- equipment and construction methods
- any dredging required, including exact area and volumes to be dredged and location where spoil will be disposed (if applicable).

2.2.7 Water

Describe water requirements in accordance with the Northern Territory Department of Primary Industry and Resources *Template for the Preparation of a Mining Management Plan* (Section 6 – Water Management) [2], including:

- Project water balance. Predictions should include rainfall over wet, dry and average years
- water demand requirements for each aspect of the Project (including dust suppression, drinking water, ablutions and sewage treatment, mine water, processing of low grade ore and any other uses)
- water supply source(s) and storage
- pit dewatering requirements
- water efficiency and recycling.

2.2.8 Energy

Provide relevant information with respect to energy, including but not limited to:

- information on the Project's energy requirements, including mining fleet fuels, and electricity demand for the mine, processing operations and workers accommodation
- details of energy infrastructure requirements, for all components of the Project, including fuel storage
- consideration of alternative (renewable) sources of energy and justification of selected option
- any initiatives to improve energy efficiency.

2.2.9 Workforce and accommodation

Provide relevant information with respect to the workforce and accommodation, including but not limited to:

- details of the estimated number of people to be employed, skills base required, and likely sources (local, regional, overseas) for the workforce during construction, operation and decommissioning and closure phases
- the Proponent's proposed organisation chart
- arrangements for transport of workers to and from Project areas, including air services if required

  location of construction camps and accommodation villages with respect to the work sites, and mining and processing operations.

2.3 Closure and rehabilitation

The EIS should outline a conceptual plan for mine closure that takes into account results of materials characterisation, data on the local environmental and climatic conditions, and consideration of potential impacts through contaminant pathways and environmental receptors. The EIS should:

[2] https://minerals.nt.gov.au/__data/assets/word_doc/0019/256060/AA7-030-Template-for-the-Preparation-of-a-Mining-Management-Plan.docx

- describe proposed rehabilitation, decommissioning, closure and relinquishment for all aspects of the Project on completion of mining / operations on individual sites, including any progressive rehabilitation and backfilling of pits
- describe any plans for use of infrastructure such as the barge facility if not decommissioned at completion of mining, or any expressions of interest from third parties for future use of the infrastructure
- describe proposed post-mining outcomes and land uses
- demonstrate that ecologically sustainable mine closure can be achieved, consistent with proposed post-mining outcomes and land uses, without unacceptable liability to the Territory, and how this will be monitored in the long term.

The EIS should discuss alternative options for rehabilitation and closure and commit to reviewing and refining these over the life of the Project.

The EIS should include a conceptual Mine Rehabilitation and Closure Plan (MRCP), specific to the Project. The draft MRCP should include description of:

- proposed closure objectives, standards and criteria and future land tenure and land-use arrangements
- proposed approach for securing a safe, stable and non-polluting mine-site
- proposed staging and timing of rehabilitation and closure
- removal of plant, equipment, infrastructure and water storages, and methods proposed for stabilisation of affected areas
- proposed methods for topsoil management and soil profile reconstruction, with demonstration of their effectiveness for rehabilitating disturbed areas
- proposed revegetation strategies, including any research and investigations that may be required
- measures to stabilise soils to erosion levels similar to comparable landforms in surrounding undisturbed areas
- contingencies to make landforms and mine components secure and non-polluting in the long term
- proposed funding and management arrangements for closure (both planned and unexpected), including responsibilities for post-closure management.

The MRCP should identify risks to the successful rehabilitation and closure of the Project, including:

- closure timeframes and objectives
- risks that the Project may create an ongoing environmental, social and/or economic legacy if operations are required to cease ahead of schedule due to unforeseen circumstances, prior to the planned closure and rehabilitation of the site
- the post-closure risk assessment should include a discussion of the effects of:
    - changes in the assumptions used as a basis for the post-closure risk assessment
    - natural events, including earthquakes, rainfall events, fire and flood.

The EIS should identify the factors that could influence unanticipated or early closure or care and maintenance of the mine and the impacts to rehabilitation objectives. The EIS

should include discussion of the Proponent's environmental obligations and commitments in managing high risk aspects of the Project should temporary or unexpected closure or suspension occur at any stage during the life of the Project.

2.4 Approvals and conditions

The EIS must provide information on requirements for approval or conditions that apply, or that the Proponent reasonably believes are likely to apply, to the Project, including, but not limited to:

- a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority
- a summary of current agreements between the Proponent and the Northern Territory Government, and/or the Australian Government, and/or other stakeholders, including Traditional Owners and/or land occupiers/managers
- a statement identifying additional approvals that are required
- a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the Project.

When identifying the individual approval(s), certificates, permits etc. the Proponent must include details of the approval(s), certificates, permits etc., including any conditions imposed. Consideration should be given, but not limited to, the following legislation:

- *Aboriginal Land Rights Act 1976*
- *Native Title Act 1993*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Assessment Act* and Environmental Assessment Administrative Procedures
- *Heritage Act*
- *Marine Act*
- *Mining Management Act*
- *Minerals Titles Act*
- *Northern Territory Aboriginal Sacred Sites Act*
- *Public and Environmental Health Act* and Regulations
- *Territory Parks and Wildlife Conservation Act*
- *Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act*
- *Waste Management and Pollution Control Act*
- *Water Act*
- *Weeds Management Act*
- *Work Health and Safety (National Uniform Legislation) Act.*

3 Existing environment

Studies used to describe the existing environment of the Project and its surrounds should be of a scope and standard sufficient to serve as a benchmark (or baseline) against which the impacts of the Project over time may be assessed. The emphasis placed on existing environmental aspects and the level of detail in the EIS should reflect

the significance of identified potential impacts and risks as a result of the Project and the scale and nature of the studies required to clearly define those potential impacts and risks.

3.1 Physical environment

The description of the physical environment must include:

- weather and climate (e.g. rainfall patterns [magnitude and seasonality], temperature, humidity, wind, climate extremes, and any seasonal conditions [e.g. floods or dust storms], which may influence the operation and/or rehabilitation, etc.)
- regional and significant topography and geomorphology
- regional geology (e.g. major units, geotechnical surveys, seismic stability, significant geological properties that may influence stability, etc.)
- soil types and land unit(s), including details of any limiting properties of soil and substrate types (e.g. susceptibility to erosion, waterlogging) in the Project footprint
- background air quality, such as seasonal ambient dust conditions, and noise levels at locations where amenity could be significantly impacted by the Project
- surface water, including:
    - major and minor rivers and drainage lines (permanent and ephemeral)
    - catchment boundaries
    - surface water flow directions and seasonal flow rates
    - water reservoirs (natural and artificial)
    - wetlands
    - areas of periodic inundation
    - beneficial uses
    - surface water quality, including temporal variations
- groundwater aquifers and hydrogeological properties, including:
    - surface connections via springs or recharge zones
    - local and regional aquifers
    - depth to water tables, including temporal variation
- oceanic processes, including:
    - maps and interpretation of regional bathymetry and local-scale seabed features
    - results and interpretation of any geotechnical investigations undertaken to inform construction of Project components
    - tidal cycles/range within Limmen Bight
    - details of any tidal inundation and storm surge zones in the estuary.

3.2 Biological environment

The EIS should describe biological values including fauna, flora and vegetation communities of the Project area and region. The EIS should include details of the scope, survey/program timing (survey season/s), locations and methods, to demonstrate

appropriate and sufficient survey effort. At a minimum, surveys should be in accordance with the Northern Territory[3] and Australian Government[4] guidelines. Include details of how surveys are consistent with (or a justification for divergence from) current applicable Northern Territory and Australian Government guidelines and policy statements.

The EIS should describe, quantify and map, where relevant:

- vegetation community types occurring on and adjacent to the Project locations
- significant or sensitive vegetation types and/or ecosystems (terrestrial, aquatic and marine) likely to be affected by the Project, including areas already cleared or disturbed (if any)
- the presence or likely presence of species listed under the EPBC Act and/or the *Territory Parks and Wildlife Conservation Act* and commercially significant native species within the Project area and in any areas that may be impacted by the Project
- Listed fauna species including, but not limited to:
    - Gouldian finch *Erythrura gouldiae*
    - Loggerhead turtle *Caretta caretta*
    - Leatherback turtle *Dermochelys coriacea*
    - Olive Ridley turtle *Lepidochelys olivacea*
    - Green turtle *Chelonia mydas*
    - Hawksbill turtle *Eretmochelys imbricata*
    - Flatback turtle *Natator depressus*
    - Gulf snapping turtle *Elseya lavarackorum*
    - Crested shrike-tit (northern) *Falcunculus frontatus whitei*
    - Red goshawk *Erythrotriorchis radiatus*
    - Australian painted snipe *Rostratula australis*
    - Masked owl *Tyto novaehollandie kimberli*
    - Northern quoll *Dasyurus hallucatus*
    - Bare-rumped sheath-tailed bat *Saccolaimus saccolaimus nudicluniatus*
    - Ghost bat *Macroderma gigas*
    - Great knot *Calidris tenuirostris*
    - Red knot *Calidris canutus*
    - Black-tailed godwit *Limosa limosa*
    - Eastern curlew *Numenius madagascariensis*
    - Western Alaskan bar-tailed godwit *Limosa lapponica bauera*
    - Northern Siberian bar-tailed godwit *Limosa lapponica menzbieri*

[3] Northern Territory Environment Protection Authority, 2013. Guidelines for Assessment of Impacts on Terrestrial Biodiversity, available at: http://www.ntepa.nt.gov.au/__data/assets/pdf_file/0003/349941/guideline_assessment_terrestrial_biodiversity.pdf.

[4] Department of the Environment, 2011. Survey Guidelines for Nationally Threatened Species, available at: http://www.environment.gov.au/epbc/policy-statements.

- Greater sand plover *Charadrius leschenaultia*
- Lesser sand plover *Charadrius mongolus*
- Fork-tailed swift *Apus pacificus*
- Lesser frigatebird *Fregata ariel*
- Roseate tern *Sterna dougallii*
- Common sandpiper *Actitis hypoleucos*
- Sharp-tailed sandpiper *Calidris acuminata*
- Osprey *Pandion haliaetus*
- Crested tern *Thalasseus bergii*
- Dugong *Dugong dugon*
- Australian snubfin dolphin *Orcaella brevirostris*
- Australian humpback dolphin *Sousa chinensis*
- Sawfish *Pristis spp*.
- Narrow sawfish *Anoxypristis cuspidate*
- Salt-water crocodile *Crocodylus porosus*
- Pipefish (*Hippichthys cyanospilus, H. parvicarinatus* and *H. penicillus*)

- location and description of suitable habitat for listed species (terrestrial, aquatic and marine) and commercially significant native species likely to be affected by the Project, including the locations of historic records and consideration of habitat suitable for breeding, foraging, aggregation or roosting
- the presence, or likely occurrence, of introduced and invasive species (both flora and fauna) within and adjacent to the Project area, and regionally, including weed species declared under the *Weeds Management Act*.

The EIS should use the most current data from the Department of Environment and Natural Resources' NT Flora and Fauna Atlases (http://www.lrm.nt.gov.au/nrmapsnt). The EIS should include the results of baseline habitat descriptions of areas identified for disturbance, including habitat adjacent to the project disturbance footprint that may be at risk of indirect impacts, and targeted surveys for fauna and flora species that have some likelihood of occurring in those habitats. The surveys should be undertaken by a suitably qualified and experienced person that has demonstrated experience in the surveying for and the identification of species in the Northern Territory.

3.3 Cultural and historic environment

The EIS should outline the cultural and heritage significance of sites located during archaeological and anthropological investigations on or near the Project area or that could be impacted by the Project activities. Baseline information should be provided regarding historic or cultural heritage values in the region, including:

- a description and location of Aboriginal and non-Aboriginal sites, places or objects of historic or cultural heritage significance
- areas listed on Commonwealth and Northern Territory registers of historic and/or cultural heritage
- provision of evidence of an Authority Certificate under the *Northern Territory Aboriginal Sacred Sites Act* or an application under the Act.

Archaeological and anthropological assessments and surveys for sites of historic or cultural heritage value must be undertaken by suitably qualified persons with demonstrated experience in archaeological and anthropological assessments. No information of a confidential nature, particularly related to anthropological matters relevant to Aboriginal people or groups is to be disclosed in the EIS.

The EIS must outline consultations with Aboriginal stakeholders and Traditional Owners for all areas potentially affected by the Project. Determination and details should be provided of current Traditional Owner utilisation of Project areas, and spiritual/cultural significance of potentially impacted areas.

The EIS should provide information on the current status of any approvals, permits or clearances in relation to the protection of heritage items or places.

3.4 Socio-economic environment

The EIS should include a brief description of the current population, demography and socio-economic aspects of the region, and key stakeholders that may be impacted by the Project.

The existing socio-economic values of the region should be outlined including but not limited to the Limmen National Park and the contribution of tourism to the region and along the Savannah Way, the recreational and commercial fishing industries in the Roper River and river mouth, the pastoral industry, and existing mineral and petroleum-based industries in the region.

4 Impact assessment

The EIS should be undertaken with specific emphasis on the identification, analysis and mitigation of potential environmental impacts and risks through a whole-of-project impact analysis and risk assessment. Through this process, the EIS should:

- transparently identify any inherent environmental impacts associated with the Project including potential direct, indirect and cumulative environmental impacts
- analyse the risks (likelihood and consequence) associated with predicted impacts to the environment
- evaluate the significance of the potential impacts and risks in a local and regional context
- identify management measures to avoid and mitigate environmental impacts and risks, and monitoring measures to demonstrate effectiveness in achieving predicted outcomes
- identify levels of uncertainty about the assessment and the effectiveness of controls in minimising/mitigating potential impacts
- explicitly identify those members of the community expected to accept residual significant impacts and their consequences
- demonstrate that the Project represents best practicable technology
- demonstrate that the Project is consistent with ecologically sustainable development principles and the National Strategy for Ecologically Sustainable Development.

A number of environmental factors that could potentially be impacted have been identified through a preliminary assessment of the Project. Further potential environmental impacts and risks may be identified through the EIS process. If relevant,

these potential impacts and risks should be outlined and appropriate management initiatives developed to demonstrate that:

- the Proponent is fully aware of the potential environmental impacts and risks associated with all predictable aspects of the Project
- the prevention and mitigation of potential impacts and risks is properly addressed in the design specifications
- the potential impacts and risks can and will be managed effectively during the construction, operation, decommissioning, closure and post-closure phases of the Project.

Information provided should permit the general reader to understand the likelihood and consequence of each potential environmental impact and risk presented by the Project, as well as any uncertainty about the effectiveness of proposed controls. Levels of uncertainty that preclude robust quantification of impact should be clearly acknowledged. Where adaptive management is proposed, the EIS should define clear, appropriate and measurable management objectives and outcomes, identify potential areas of uncertainty and impacts, describe appropriate monitoring programs, specify quantitative triggers for intervention and describe proposed management actions in response to those triggers. Ongoing monitoring and feedback loops should also be described.

Sufficient quantitative analysis should be provided to indicate the Proponent's views about whether impacts are likely to be acceptable or tolerable. A comparison can be made with similar ventures in Australia and internationally. Assumptions used in the analyses should be explained.

The EIS should include appropriate consideration of the impacts on the general environment, ecosystems and matters of national environmental significance and discuss whether those impacts could be permanent. If the impacts are not permanent, include an indication of the potential timeframe expected to achieve recovery from any impacts and identify how soon restoration of habitat could be achieved to reinstate ecosystem function.

Cumulative impacts

An assessment of cumulative environmental impacts should be undertaken that considers the potential impact of the Project in the context of existing developments, and reasonably foreseeable future developments. The impact and risk assessment should consider and discuss cumulative impacts, where relevant, and account for impacts on an appropriate scale, recognising that:

- landscape change originates not only from single projects and management actions, but also from complex and dynamic interactions of multiple past, present and future management actions
- biophysical, social and economic change accumulates through additive or interactive (or synergistic) processes. The aggregate impact of multiple actions on the environment can be complex and may result in impacts that are more significant because of interactive processes
- any given action does not operate in isolation. The most significant changes are often not the result of the direct effects of an individual action, but from the combination of multiple minor effects over time.

4.1 Preliminary environmental factors

The NT EPA has identified the following preliminary environmental factors that may be impacted by the Project:

1. Benthic Communities and Habitat
2. Marine Flora and Fauna
3. Marine Environmental Quality
4. Terrestrial Flora and Fauna
5. Landforms
6. Hydrological Processes
7. Inland Water Environmental Quality
8. Aquatic Ecosystems
9. Air Quality and Greenhouse Gases
10. Social, Economic and Cultural Surroundings.

The EIS is to provide sufficient information regarding the potential impacts and risks arising from the Project and the proposed management and mitigation measures to be implemented to meet the NT EPA's environmental objectives relating to each of the factors as detailed below.

4.1.1 Benthic Communities and Habitat

The NT EPA's objective related to Benthic Communities and Habitat is to:

- protect benthic communities and habitats so that biological and functional diversity and ecological integrity are maintained.

4.1.1.1 Potential impacts and risks

The EIS should provide information to assess potential impacts and risks to benthic habitat values including (but not limited to):

- details of the area, locations and extent of any planned or predicted disturbance to benthic communities as a result of the Project and areas adjacent to those locations that may be affected
- effects of erosion and sedimentation in the Roper River from barge facility construction activities, propeller wash and vessel wakes
- dust and substances that, if spilled, have potential to smother, attenuate light or be toxic to marine and estuarine benthos
- changes to hydrology in the Roper River through installation of the barge facility
- the potential for disturbance of acid sulphate soils
- the potential introduction and/or spread of exotic marine pest species.

4.1.1.2 Mitigation and monitoring

The EIS should outline how the Proponent will minimise, monitor and manage potential impacts and risks to benthic habitats and communities as outlined above, including:

- any measure identified as appropriate to mitigate potential impacts or risks
- any additional monitoring to detect unanticipated impacts
- the expected recovery of benthic habitat and communities after mine closure and decommissioning, including post-closure monitoring and reporting to be used to evaluate recovery and progress toward achieving closure objectives, and contingency measures to be implemented in the event that monitoring demonstrates that closure objectives are not being met.

The EIS should contain clear and concise methods to mitigate likely impacts on benthic habitat and communities. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies.

4.1.2 Marine Flora and Fauna

The NT EPA's objective related to Marine Flora and Fauna is to:

- protect marine flora and fauna so that biological diversity and ecological integrity are maintained.

4.1.2.1 Potential impacts and risks

Describe potential impacts and risks to marine and estuarine fauna listed in Section 3.2 including (but not limited to) collision with vessels, disturbance through light and noise, disturbance to the water column, and increased particulate matter from dust and product spills.

The EIS should include:

- a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts to listed threatened, migratory and/or marine species, and commercially significant species in the local, regional, Territory, national and international context
- a statement whether any relevant impacts to listed threatened, migratory and/or marine species are likely to be unknown, unpredictable or irreversible
- analysis of the significance of the relevant impacts
- any technical data and other information used or needed to make a detailed assessment of the relevant impacts to listed threatened, migratory and/or marine species.

The EIS should include references to relevant research, statutory advice and statutory plans, such as conservation advices, action plans, recovery plans and threat abatement plans, when assessing the risks. The EIS should also demonstrate how the action is not inconsistent with the relevant statutory recovery plans and threat abatement plans.

4.1.2.2 Mitigation and monitoring

The EIS should outline how the Proponent will minimise, monitor and manage potential impacts and risks to marine and estuarine fauna as outlined above, including:

- any measure identified as appropriate to mitigate potential impacts or risks
- an assessment of the expected effectiveness of the mitigation measures and any statutory or policy basis for the mitigation measures.

The EIS should contain clear and concise methods to mitigate likely impacts on marine and estuarine fauna. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies.

4.1.2.3 Relevant policy and guidelines

Threat abatement plans, action plans and recovery plans for listed species under the EPBC Act[5].

4.1.3 Marine Environmental Quality

The NT EPA's objective related to Marine Environmental Quality is to:

- maintain the quality and productivity of water, sediment and biota so that environmental values are protected.

4.1.3.1 Potential impacts and risks

Describe potential impacts and risks to marine and estuarine environmental quality such as increased sediment load, dust, spills, and disturbance to the water column.

4.1.3.2 Mitigation and monitoring

The EIS should describe how the Proponent will minimise, monitor and manage potential impacts and risks to marine and estuarine environmental quality as outlined above, including:

- any measure identified as appropriate to mitigate potential impacts or risks
- an assessment of the expected effectiveness of the mitigation measures and any statutory or policy basis for the mitigation measures
- a monitoring program that includes relevant trigger values or thresholds, based on appropriate guidelines and/or standards and ideally on local background conditions. The monitoring program should outline reporting procedures and contingencies that will be implemented in the event that monitoring activities identify that any performance indicators have been triggered.

4.1.3.3 Relevant policy and guidelines

ANZECC and ARMCANZ Australian and New Zealand Guidelines for Fresh and Marine Water Quality[6]

4.1.4 Terrestrial Flora and Fauna

The NT EPA's objective related to Terrestrial Flora and Fauna is to:

- protect the NT's flora and fauna so that biological diversity and ecological integrity are maintained.

[5] http://www.environment.gov.au/biodiversity/threatened

[6] https://www.environment.gov.au/system/files/resources/53cda9ea-7ec2-49d4-af29-d1dde09e96ef/files/nwqms-guidelines-4-vol1.pdf

4.1.4.1 Potential impacts and risks

The EIS should describe potential impacts and risks to terrestrial flora and fauna including:

- the extent of clearing and disturbance/change to fauna habitat (in the context of the extent of the habitat), with a particular focus on fauna species of conservation significance such as the Gouldian finch
- interaction with vehicles
- changes to hydrology
- introduction and spread of weed species
- dust emissions
- noise.

4.1.4.2 Mitigation and monitoring

The EIS should describe how the Proponent will avoid, minimise or mitigate, monitor and manage potential impacts on terrestrial fauna, including those outlined above.

The EIS should contain clear and concise methods to mitigate the identified impacts to terrestrial flora and fauna. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies.

4.1.4.3 Relevant policy and guidelines

The NT EPA has *Guidelines for Assessment of Impacts on Terrestrial Biodiversity*[7] available on the NT EPA website.

4.1.5 Landforms

The NT EPA's objective related to Landforms is to:

- conserve the variety and integrity of distinctive physical landforms so that environmental values are protected.

4.1.5.1 Potential impacts and risks

Describe potential impacts and risks to significant landforms in the region, which include the relatively undisturbed character of the landscape in the Roper region and the Roper River, as a result of the Project e.g. disturbance, damage or visual alteration of landscapes, significant open spaces and geological features.

Describe the extent and significance of effects on visual amenity of various components of the mine and associated infrastructure from key public vantage points, day and night, and during all stages of the Project.

4.1.5.2 Mitigation and monitoring

Describe measures to mitigate impacts of the Project to distinctive landforms or areas of conservation significance, including visual amenity.

[7] https://ntepa.nt.gov.au/__data/assets/pdf_file/0004/287428/guideline_assessment_terrestrial_biodiversity.pdf

4.1.6 Hydrological Processes

The NT EPA's objective for Hydrological Processes is to:

- maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

4.1.6.1 Potential impacts and risks

Describe potential impacts and risks from changes to hydrological processes including impacts on the environment, landholders within affected catchments and other water users.

The EIS should describe:

- water demand requirements of the Project (a water balance)
- water supply source(s), volumes, storage options and sustainability. Hydrological modelling may be required to assess sustainability in the Dry season
- proposed changes to the movement of surface waters including potential impacts on Wet season flooding regimes
- impacts to other water users including local communities, groundwater dependent ecosystems and the environment.

The EIS should consider any projected climate change effects on hydrological regimes that may occur within the proposed timeframe of the Project and how these may influence outcomes of Project activities.

4.1.6.2 Mitigation and monitoring

The EIS should describe proposed management of water for the Project for all mine-life stages and seasons including post mining, according to its source, quality, volume, end use or other parameters, including (but not limited to) measures to:

- safeguard surface and groundwater resources and their environmental values, including options for minimising water use
- ensure the protection and resilience of water dependent ecosystems, including wetlands downstream of the mine.

4.1.6.3 Relevant policy and guidelines

Australian and New Zealand Guidelines for Fresh and Marine Water Quality[8].

4.1.7 Inland Water Environmental Quality

The NT EPA's objective for Inland Water Environmental Quality is to:

- maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

[8] https://www.environment.gov.au/system/files/resources/53cda9ea-7ec2-49d4-af29-d1dde09e96ef/files/nwqms-guidelines-4-vol1.pdf

4.1.7.1 Potential impacts and risks

Describe potential impacts and risks to inland waters environmental quality and sensitive receptors.

The EIS should include a conceptual site model describing potential sources, pathways, receptors, and fate of any potentially contaminated waters from the Project. The model should be of sufficient detail for the general reader to understand the source(s) of potential contaminants, the mechanism(s) of their release, the pathway(s) for transport, and the potential for human and ecological exposure to these potential contaminants. The minimum data required to support the model should include, but should not be limited to:

- relevant laboratory and field testing to characterise the potential physicochemical properties of mine products and infrastructure (e.g. stockpiles, etc.)
- material volume and mass of potential contaminant sources
- hydrogeological characterisation (e.g. groundwater occurrence, direction and rate of flow, etc.)
- hydrologic characterisation (e.g. surface water flow, seasonality etc.)
- baseline water quality (i.e., major cations and anions, metals, metalloids, acidity/alkalinity, etc.) of receiving waters
- biological receptors and their habitats
- other complementary technical studies, at an appropriate temporal and spatial scale, used to develop the model, such as:
  - geology
  - hydrology
  - hydrogeology
  - geochemistry
  - biology
  - meteorology
  - engineering/geotechnical.

An appropriately qualified and experienced person should be involved with the supervision and interpretation of test results and the development of the model. Appropriate statistical design details including the number of samples, sampling site selection procedures and quality assurance and quality control protocols to support the development of the model should be provided and justified.

4.1.7.2 Mitigation and monitoring

The EIS should provide a draft Water Management Plan (WMP) prepared by a suitably qualified expert. All mitigation measures in the WMP should be adequately detailed to demonstrate best practicable management and that environmental values of receiving waters will be maintained. The WMP should include, but not be limited to:

- proposed management to contain contaminants onsite and details of contingency measures that will be implemented in the event of a spill or leak of chemicals that could impact on downstream water quality

- management of various categories of water (e.g. 'clean', 'dirty' and 'contaminated' - definitions can be provided in the draft EIS) including water quality thresholds triggering management actions
- management of chemicals and hydrocarbons
- management of process rejects and associated water during operations and post closure
- management of problematic waste rock during operations and post-closure
- non-mineral waste management strategies, including reduction, re-use, recycling, storage, transport and disposal of waste
- management of domestic wastewater and sewage
- management of high/extreme rainfall events including Probable Maximum Precipitation and provisions for extreme rainfall and flood events in the management of waste rock and process rejects, including erosion protection and management of seepage
- management of erosion and sedimentation[9]
- construction quality control processes
- measures to avoid the exposure of sensitive biological receptors to contaminants or water of a poor quality
- measures to ensure treatment / neutralisation of hazardous materials occurs to identified safe levels, before any controlled environmental release is considered.

The WMP should include monitoring programs that detail relevant water quality target values based on appropriate guidelines and/or standards and preferably on local ambient conditions. The monitoring programs should include:

- methods to monitor the impacts of the Project on surface and groundwater quality and quantity during mine operations and beyond mine closure
- monitoring for and management of potential AMD waste rock seepage
- provisions to notify and respond to environmental risks associated with water quality
- contingency plans to be implemented should monitoring identify an unacceptable impact.

The draft WMP should be linked closely to an Erosion and Sediment Control Plan for the Project.

The EIS should describe post-mining management, monitoring and reporting for potential impacts and risks to downstream water quality following mine closure including evaluation of rehabilitation success and progress toward achieving closure objectives, and contingency measures to be implemented in the event that monitoring demonstrates that rehabilitation closure objectives are not being met.

[9] An Erosion and Sediment Control Plan for the Project should be prepared by a suitably qualified and experienced professional in erosion and sediment control planning. Further information relating to erosion and sediment control can be found at www.austieca.com.au and on the Department of Land Resource Management website at: http://lrm.nt.gov.au/soil/management.

4.1.7.3 Relevant policy and guidelines

Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

4.1.8 Aquatic Ecosystems

The NT EPA's objectives for Aquatic Ecosystems are to:

- protect aquatic ecosystems to maintain the biological diversity of flora and fauna and the ecological functions they perform.

4.1.8.1 Potential impacts and risks

The EIS should:

- describe how potential impacts to aquatic habitat from changes in hydrological regimes and inland water environmental quality as identified above could significantly impact aquatic fauna
- assess potential impacts and risks of (but not limited to) the following as a result of the Project:
    - loss or reduction of flows in the Dry season
    - shrinkage of waterholes during the Dry season
    - changes in water chemistry in ephemeral waterholes during the Dry season
- assess the risks to aquatic fauna of conservation significance such as freshwater sawfishes listed in Section 3.2, and restricted populations of *Cinetodus froggatti* (Small-mouthed Catfish) and *Thryssa scratchleyi* (Freshwater Anchovy).

The EIS should include:

- a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts to listed threatened and migratory species at the local, regional, Territory, national and international context
- a statement of whether any relevant impacts to listed threatened and migratory species are likely to be unknown, unpredictable or irreversible
- analysis of the significance of the relevant impacts
- any technical data and other information used or needed to make a detailed assessment of the relevant impacts to listed threatened and migratory species.

The EIS should include references to relevant research, statutory advice and statutory plans, such as conservation advices, action plans, recovery plans and threat abatement plans, when assessing the risks. The EIS should also demonstrate how the action is not inconsistent with the relevant statutory recovery plans and threat abatement plans.

4.1.8.2 Mitigation and monitoring

The EIS should outline how the Proponent will avoid, minimise or mitigate, monitor and manage potential impacts on aquatic ecosystems, including impacts and risks from:

- changes to hydrology
- erosion and sedimentation
- contamination and poor water quality.

The EIS should contain clear and concise methods to mitigate likely impacts to aquatic habitat and fauna. All mitigation and monitoring measures should be substantiated and in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies.

4.1.8.3 Relevant policy and guidelines

Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

4.1.9 Air Quality and Greenhouse Gases

The NT EPA's objective related to Air Quality and Greenhouse Gases is to:

- maintain air quality and minimise emissions and their impact so that environmental values are protected.

4.1.9.1 Potential impacts and risks

Describe potential impacts and risks to air quality including impacts and risks to the environment from fugitive dust emissions.

The EIS should:

- provide an inventory of significant emissions to air likely to result from the Project (e.g. dust)
- identify and provide the location of sensitive receptors
- include reporting requirements and compliance with relevant environmental standards.

4.1.9.2 Mitigation and monitoring

The EIS should describe management of air quality, including:

- management of dust, including target thresholds with reference to regulatory industry-standard, safe limits or aspirational parameter levels
- strategies for minimising emissions from burning fossil fuels
- management of air quality post mining, including post-mining monitoring and reporting to be used to evaluate rehabilitation success and progress toward achieving closure objectives for dust, and contingency measures to be implemented in the event that monitoring demonstrates that rehabilitation closure objectives are not being met.

4.1.10 Social, Economic and Cultural Surroundings

The NT EPA's objective related to Social, Economic and Cultural Surroundings is to:

- protect the rich social, economic, cultural and heritage values of the Northern Territory.

4.1.10.1 Potential impacts and risks

Describe potential impacts and risks to the local, regional and Territory social and economic surroundings.

An Economic and Social Impact Assessment (ESIA) should be developed that:

1. documents the positive and negative economic and social impacts of the project

2. assesses the risks of the Project not realising its projected economic and social benefits.

The following are suggestions that may assist with highlighting the social and economic value of the Project and are not intended to result in the disclosure of confidential information:

- a summary of the Project's economic feasibility
- estimated capital and annual operational expenditure
- estimated total project revenue for the duration of the Project (to provide the economic scale of the Project)
- estimated payments to governments
- estimated total contribution to Gross State Product and Gross Domestic Product over the economic life of the Project
- opportunities available to regional centres based on the activity generated by the Project (construction, operation and rehabilitation)
- estimated workforce and contractor numbers by occupational classification
- overall employment training proposed during construction, operation and rehabilitation
- planned Aboriginal employment, training, participation and other potential benefits
- availability of goods and services
- community and economic value of any residual infrastructure, such as roads, following the life of the Project, and
- other contributions to local communities.

The EIS should include a balanced summary of the social and economic value (positive and negative) of the Project on a regional, state and national scale.

The EIS should consider potential negative impacts including, where relevant, increased loads on limited services; interaction with isolated communities; effects on the water supply of communities; impacts on the amenity of the area from noise and dust; impacts to tourism, other industries and regional communities as a result of road upgrades and haulage[10]; and disturbance of sacred sites, living cultural values and/or areas of traditional resource use.

4.1.10.2 Mitigation and monitoring

A draft Social Impact Management Plan (SIMP) and draft Cultural Heritage Management Plan (CHMP) should be prepared that addresses any potential impacts and risks identified through the ESIA. At a minimum, the SIMP and CHMP should:

- describe how the Proponent proposes to manage any identified economic, social, cultural risks arising from the Project, or its associated workforce
- describe how potential local and regional business and employment opportunities related to the Project will be identified and managed

[10] A Traffic Impact Assessment will be required in accordance with the AUSTROADS *Guide to Traffic Management Part 12: Traffic Impacts of Development.*

- outline a strategy for engaging with local Aboriginal communities to facilitate employment on the Project. This should include the delivery of training, the identification of suitable roles, and a discussion of how cultural values will be accommodated
- include a mechanism for monitoring and reporting any identified potential socio-economic and cultural impacts
- include measures to mitigate negative economic and social impacts on the locality and region
- provide outcome and assessment criteria that will give early warning in the event that management and mitigation measures are not achieving the outcomes and benefits identified and expected by the Proponent
- provide a stakeholder communications strategy including identification of, and ongoing consultation and negotiations with, all relevant stakeholders, ensuring the full range of community viewpoints are sought using culturally- and language-appropriate methods, and included in the EIS
- provide details of the Project's requirements to apply to, or applications already made to, the NT Minister for Tourism and Culture to disturb or destroy a prescribed archaeological place and/or object under the *Heritage Act*
- outline procedures to avoid significant sites and protect key sites during construction, operation and decommissioning work
- describe procedures for the discovery of surface or sub-surface objects of interest/potential cultural significance during the course of the Project.

The EIS should outline plans for rehabilitation and closure that ensures risks to social parameters, including traditional owners and Aboriginal communities, will be as low as is reasonably achievable. This should include mechanisms for evaluating rehabilitation success and progress toward achieving closure objectives associated with community expectations and agreements.

4.1.10.3 Relevant policy and guidelines

The NT EPA has *Guidelines for the Preparation of an Economic and Social Impact Assessment*[11]

The Proponent may also wish to refer to the International Association for Impact Assessment (IAIA), *Social Impact Assessment: Guidance for assessing and managing the social impacts of projects*, April 2015. https://www.iaia.org/uploads/pdf/SIA_Guidance_Document_IAIA.pdf.

5 Environmental management

The specific safeguards and controls proposed to be employed to minimise or mitigate potential environmental impacts identified in the impact assessment process are to be included in a draft Environmental Management Plan (EMP). The EMP should be strategic, describing a framework for continuing management, mitigation and monitoring programs for the significant environmental impacts of the Project.

The scope, content and structure of the EMP will be a function of the outcomes of the environmental impact assessment and determined by the significance of the potential environmental impacts and risks. The EMP should not be prepared in isolation but

[11] https://ntepa.nt.gov.au/__data/assets/pdf_file/0006/287430/guideline_assessment_economic_social_impact.pdf

should be consistent and integrated with the principles of an environmental management system. The EMP should include specialised management plans where it is necessary to provide a high level of operational detail. As much detail as is practicable should be provided to enable adequate assessment of the proposed environmental management practices and procedures.

The EMP needs to address the Project phases (e.g. construction, operation and decommissioning/rehabilitation) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, necessary resourcing, responsibility and timing for each environmental issue.

Further information on the development of an EMP is available in the NT EPA's *Guidelines for the Preparation of an Environmental Management Plan*[12].

6 Environmental offsets

The Australian Government Environmental Offsets Policy[13] requires residual (after avoidance and mitigation measures have been implemented) significant impacts to be offset, with a focus on direct offsets. The Offsets Assessment Guide, which accompanies this policy, has been developed to give effect to the policy's requirements, utilising a balance sheet approach to quantify impacts and offsets. It applies where the impacted protected matter is a threatened species or ecological community.

The EIS should provide information on:

- any identified impacts or detriments that cannot be avoided or mitigated at reasonable costs and whether these impacts could be considered as 'significant' under the EPBC Act
- risks of failure of management actions (such as rehabilitation, weed control, etc.) and uncertainties of management efficacy
- proposed offsets for residual significant impacts to protected matters and an explanation as to how these proposed offsets are consistent with the requirements of the Environmental Offsets Policy and *Offsets Assessment Guide*, where relevant.
- how the proposed offsets meets the Environmental Offsets Policy requirement of a minimum of 90% 'direct offsets' (direct offsets are actions which provide a measurable conservation gain for the impacted protected matter).

7 General advice on the EIS

7.1 General content

The EIS should be a stand-alone document. It should contain sufficient information to avoid the need to search out previous or additional, unattached reports. Information from the Sherwin Creek Iron Ore Project EIS may be used where appropriate but should be provided in full rather than cross-referenced.

The EIS should enable interested stakeholders and the NT EPA to understand the environmental consequences of the Project. Information provided in the EIS should be objective, clear, succinct and easy to understand for the general reader. Spatially-

[12] https://ntepa.nt.gov.au/__data/assets/pdf_file/0006/284883/guideline_prep_emp.pdf

[13] Department of the Environment 2012 *Environmental Offsets Policy*, Available at: http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy

referenced maps (using an appropriate scale, resolution and clarity), plans, diagrams and other descriptive detail should be included. Technical jargon should be avoided or accompanied by a clear explanation so that it is readily understandable. Cross-referencing should be used to avoid unnecessary duplication of text.

The EIS should describe and compare any feasible alternatives to carrying out the Project including, if relevant, the alternative of taking no action. The choice of the preferred option(s) should be clearly explained and justified, including how it complies with the principles and objectives of ecologically sustainable development. Sufficient details should be provided to justify the preferred Project scope and components.

The level of analysis and detail in the EIS should reflect the level of significance of the potential impacts on the environment, as determined through adequate technical studies. Consideration of appropriate spatial, temporal and analytical scales should be used to clearly communicate the potential impacts to the environment. Reliability of the data and an explanation of the sampling criteria and approach should be provided where data are used to support statements, studies and claims in the EIS.

Information materials summarising and highlighting risks of the Project should be provided in a culturally appropriate format and language, accompanied by graphics and illustrations that assist with interpretation, where relevant.

It is an offence under the *Northern Territory Environment Protection Authority Act* to give information to the NT EPA that the person knows is misleading or contains misleading information.

7.2 Information requirements

The NT EPA has prepared Guidelines to assist in the preparation of EIS documents. The Guidelines are developed and updated periodically, and should be referenced and referred to when addressing the information requirements in an appropriate section of EIS. The Guidelines, current at the time of publication of these Terms of Reference include:

- *Guidelines for Assessment of Impacts on Terrestrial Biodiversity*
- *Guidelines on Conceptual Site Models*
- *Guidelines on Acid and Metalliferous Drainage (AMD)*
- *Guidelines for the Preparation of an Economic and Social Impact Assessment*
- *Guidelines for Reporting on Environmental Monitoring*
- *Guidelines on Environmental Offsets and Associated Approval*
- *Guidelines for the Preparation of an Environmental Management Plan.*

The Guidelines are available on the following NT EPA webpages:
https://ntepa.nt.gov.au/environmental-assessments/assessment-guidelines
https://ntepa.nt.gov.au/waste-pollution/guidelines/guidelines

7.3 Structure, format and style

The EIS should comprise of three elements:

1. Executive summary

The executive summary must include a brief outline of the Project and each chapter of the EIS, allowing the reader to obtain a clear understanding of the proposed action, its

environmental implications and management objectives. It must be written as a standalone document, able to be reproduced on request by interested parties who may not wish to read the EIS as a whole.

2. Main text of the document

The main text of the EIS should include a list of abbreviations, a glossary to define technical terms, acronyms, abbreviations, and colloquialisms. The document should consist of a series of chapters detailing the level of significance and management of the expected and potential impacts on the environment from the proposed action.

3. Appendices

The appendices must include detailed technical information, studies or investigations necessary to support the main text. These will be made publicly available and should include at a minimum:

- a table listing how these Terms of Reference have been addressed in the EIS, cross-referenced to chapters, page numbers and/or appendices
- the name of, work done by and the qualifications and experience of the persons involved in preparing the EIS
- a table listing commitments made by the Proponent
- detailed technical information, studies or investigations necessary to support the main text.

The EIS should be produced on A4 size paper capable of being photocopied, with any maps, diagrams or plans on A4 or A3 size paper, and in colour, if possible.

7.4 Referencing and information sources

All sources must be appropriately referenced using the Harvard Standard. The reference list should include the address of any internet pages used as data sources. All referenced supporting documentation and data, or documents cited in the EIS must be available upon request. For information given in the EIS, the EIS must state:

- the source of the information
- how recent the information is
- how the reliability of the information was tested
- what uncertainties (if any) are in the information.

All variables used or assumptions made in the EIS must be clearly stated and discussed. Confidence levels must be specific, as well as the sources from which they were obtained. The extent to which a limitation, if any, of available information may influence the conclusions of the environmental assessment should be discussed. The results of quality control and quality assurance (QA/QC) testing are to be provided where data are used to support statements or findings in the EIS. Sufficient discussion should accompany the data to demonstrate that the QA/QC and data are suitable and fit for purpose. The EIS must include information on any consultation about the Project, including:

- any consultation that has already taken place
- a list of persons and agencies consulted during the EIS

- if there has been consultation about the Project, any documented response to, or result of, the consultation
- proposed consultation about relevant impacts of the Project
- identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

The EIS has an important role in informing the public about this Project. It is essential that the Proponent demonstrates how any public concerns were identified and will influence the design and delivery of the Project. Public involvement and the role of government organisations should be clearly identified. The outcomes of any surveys, public meetings and liaison with interested groups should be discussed including any changes made to the proposal as a result of consultation. Details of any ongoing liaison should also be discussed.

7.5 Administration

The Proponent should lodge bound hardcopies and an electronic (Adobe PDF format) copy of the EIS with the NT EPA. The electronic copies should be provided both as a single file of the entire document and separate files of the document components. A Microsoft Word copy of the EIS should be provided to facilitate the production of the Assessment Report.

The Proponent should consider the file size, format and style of the document appropriate for publication on the NT EPA website. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

The Proponent is to advertise that the draft EIS is available for review and comment, in:

- the *NT News*
- the *Katherine Times*
- *The Australian*.

The NT EPA requires the complete EIS document and a draft of the advertisement at least one week prior to advertising the draft EIS, to arrange web upload of the document and review and comment on advertising text.

If it is necessary to make use of material that is considered to be of a confidential nature, the Proponent should consult with the NT EPA on the preferred presentation of that material, before submitting it to the NT EPA for consideration.

Spatial data should be provided to the NT EPA as importable Geographic Information System shape files, with relevant features and areas geospatially referenced and marked as polygons, lines and points.

The Proponent will be required to attend a meeting with staff of the Environment Division prior to lodgement of the draft EIS. The purpose of the meeting will be to provide an update on the administrative requirements for review of the draft EIS, including file sizes, transmission of electronic files, numbers of hard copies to be printed and to identify the start and end date of public exhibition.

7.6 Public exhibition

The NT EPA proposes a 12 week public exhibition period for the draft EIS and will confirm the duration of the period in writing after the pre-lodgement meeting. The public exhibition period may be varied at that time in consideration of the complexity of the draft

EIS and to allow adequate opportunity for the community and Government to access the draft EIS (for example, a longer exhibition period may be required if submission occurs in late December or January in any year).

The draft EIS should be provided to and be made available for public exhibition at:

- NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap
- Mining and Energy, Department of Primary Industry and Resources, 3rd Floor, Paspalis Centrepoint, 48 Smith Street Mall, Darwin
- Northern Territory Library, Parliament House, Darwin
- Roper Gulf Shire office, 29 Crawford St, Katherine
- Northern Land Council, 45 Mitchell St, Darwin
- Environment Centre Northern Territory, Unit 3, 98 Woods St, Darwin
- Minyerri, Ngukurr, Borroloola and Numbulwar in an appropriate format.

The Proponent should take all reasonable steps to obtain the views of Aboriginal people in relation to the Project and the EIS. Aboriginal people affected by the Project may have particular communication needs. Arrangements must be made to ensure that affected people have reasonable opportunity to comment and understand why they are commenting and what it is they are commenting on. This will require information to be presented in a manner that clearly articulates the Project and its potential impacts and risks, using methods that are culturally appropriate and in language that is understandable to Aboriginal people in the region e.g. Kriol or local languages. The Aboriginal Interpreter Service may be a useful resource.

8 Appendices

Appendix A

MATTERS THAT MUST BE ADDRESSED IN AN ENVIRONMENTAL IMPACT STATEMENT

(SCHEDULE 4 OF THE EPBC REGULATIONS 2000)

1 General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated Proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the Proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action; and

(h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the Proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

(i) if relevant, the alternative of taking no action;

(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and

(iii) sufficient detail to make clear why any alternative is preferred to another;

(h) any consultation about the action, including:

(i) any consultation that has already taken place;

(ii) proposed consultation about relevant impacts of the action; and

(iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation; and

(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01(d) must include

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts; and

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the Proponent.

5 Other Approvals and Conditions

5.01 Information given under paragraph 2.01(f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:

(i) what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and

(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required; and

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7 Information sources

7.01 For information given the PER must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.