Appendix E
Updated Environmental Management Framework

Prepared for
Department of Infrastructure, Planning and Logistics
ABN: 84 085 734 992

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Darwin Ship Lift Project

08-Jul-2022
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Client: Department of Infrastructure, Planning and Logistics

ABN: 84 085 734 992

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1.0 Environmental Management Framework

1.1 Overview

The Northern Territory Government (NTG) is delivering the Darwin Ship Lift Project (the Project) which comprises of the construction and operation of a ship lift facility and an adjacent maintenance facility at East Arm, Darwin. The early design and procurement of the Project has been managed by a dedicated NTG Ship Lift Project Team. Final procurement and construction will be managed by the Department of Infrastructure, Planning and Logistics (DIPL).

This document establishes the environmental management framework (EMF) for the delivery of the Project. As the Project has progressed since the initial submission of the EMF, this document incorporates refinements to the Project design and updates based on submissions from the Draft Environmental Impact Statement (EIS) process and the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC) Referral. It is designed to provide parameters for the preparation of Construction Environmental Management Plans (CEMP) and Operational Environmental Management Plans (OEMP) to ensure that potential impacts and risks associated with the delivery of the Project are managed and monitored to allow the Proponent to fulfil their environmental and social commitments and obligations.

1.2 Project Status

1.2.1 Environmental Impact Statement

In November 2018, the Northern Territory Environment Protection Authority (NT EPA) determined that the Project requires assessment under the *Environmental Assessment Act* (1982) at the level of an EIS. The NTG prepared a Draft EIS to address the Terms of Reference (ToR) that were prepared by the NT EPA to guide environmental assessment requirements.

The Draft EIS was submitted to the NT EPA in early November 2021 and was publicly displayed and circulated to NT Government Advisory Agencies. The public exhibition of the Draft EIS was undertaken from 12 November 2021 until 14 January 2022.

On 11 April 2022 direction to prepare a Supplement to the Draft Environmental Impact Statement (Supplementary EIS) was provided to the Proponent by the delegate of the NT EPA under section 12(3)(a) of the Environmental Assessment Administrative Procedures (1984).

Following the submission of the Draft EIS in November 2021, the Project procurement for the detailed design and construction of the Darwin Ship Lift Project was progressed with the selection of two preferred contractors who have participated in an Early Contractor Involvement (ECI) process to tender for the contract to deliver the Project through detailed design and construction.

The short-listed contractors have continued to progress the concept design in parallel but separate to each other and have submitted a tender reference design submission to the NTG for tender, and which are currently being evaluated.

Several updates have been made to the design, which are considered to have a potential net beneficial outcome by reducing the overall potential environmental impact through design and mitigation measures. The proposed design updates resulting from the ECI process have been considered in the Supplementary EIS. As part of this process, this EMF, which was developed as part of the Draft EIS (Chapter 13: Environmental Management Framework), has been updated to consider those design mitigations. While typically approval conditions would be received prior to the call for tenders, the procurement process has advanced concurrently to the EIS process. As a result, the tendered documentation has further informed the Supplementary EIS and EMF, providing consideration of Contractor proposed design mitigation opportunities, as well as providing inputs by the Contractor into the EMF mitigation strategies. This is largely matched by tenderer commitments and responsibilities.

As the ECI concept designs cannot be released until the contract for Darwin Ship Lift Project has been awarded (due to being in a confidential and active procurement process), the NTG has therefore reviewed the designs and provided inputs into the revised impact assessment process taking into account the submission designs.

The impact assessments and associated risks to the Project based taking into account the tendered designs have been considered as part of the Supplementary EIS (Section 7.0 and Appendix D). Following this review process which included consideration of submissions to the Draft EIS, including additional information requested by the NT EPA, this EMF has been updated.

1.2.2 EPBC Referral

A Referral under the *Environment Protection and Biodiversity Conservation Act 1999* was also lodged concurrently to the Draft EIS, to the Department of Agriculture, Water and Environment (DAWE) in August 2021 (2021/9002). An Action Decision made under Section 75 and Section 87 of the EPBC Act was provided by DAWE on 9 December 2021, being a "Controlled Action" requiring assessment and a decision under the EPBC Act. It was determined that the Project may have a significant impact on the following controlling provisions under the EPBC Act:

- Listed threatened species and communities
- Listed migratory species.

The Decision on Assessment Approach determined the Project is to be assessed via Preliminary Documentation. A request for additional information for the Preliminary Documentation was provided by DAWE on 2 February 2022. The Preliminary Documentation is being submitted to DAWE alongside the EIS Supplement.

1.3 Environmental Management Framework Process

Design and construction of the Project will be undertaken by the selected Construction Contractor and once constructed, the Darwin Ship Lift Facility will be leased to an Operator. The Department of Infrastructure Planning and Logistics (DIPL) will be the construction agency for the NTG. The Construction Contractor will be required to submit an CEMP for the Project to DIPL for review prior to commencing construction works. The Operator of the Darwin Ship Lift Facility will be required to submit an OEMP to the NTG prior to commencing operation.

Similarly, the Operator of the Privately-owned Facility will also be required to develop and implement environmental management plans which incorporate any operational conditions imposed as part of the Project approval process. The development of the environmental management requirements for the Privately-owned Facility are outside the scope of this EMF and will be regulated under separate approval processes.

This EMF provides a basis for incrementally improving management practices over time. It includes:

- environmental management objectives
- proposed mitigation measures that are designed to reduce or mitigate residual risk
- requirements for monitoring, reporting and reviewing the effectiveness of these measures.

Management measures will be revised and refined over time to ensure objectives are met.

Environmental and social impacts and risks will vary significantly in their nature and severity during the construction and operational phases of this Project. In response, this EMF discusses the construction and operational phases of the Project separately in Sections 2.0 and 3.0. Proposed objectives and mitigation measures are also presented separately for construction and operation in Sections 2.3 and 3.3 respectively. These measures focus on significant environmental factors identified in the ToR or as a result of risk assessments, technical studies and stakeholder engagement.

This EMF exists within a suite of documents that will guide the delivery of the Project. These key documents should at a minimum include the following:

- Social Impact Management Plan (SIMP)
- Heritage Management Plan (HMP).
- Noise and Vibration Management Plans
- Traffic Management Plans (TMPs)

- Erosion and Sediment Control Plan (ESCP)
- Marine Spill Response Plans
- Biosecurity Management Plan.

Each of these plans and the proposed approach to environmental management for site activities are discussed further below in Section 1.6. The Dredging and Dredge Spoil Placement Management Plan (DDSPMP) which was originally included as a commitment in the EMF, has now been drafted and forms a separate document to the EMF. The Draft DDSPMP is provided as Appendix C of the Supplementary EIS and will be a separate to the Contractor approval process as part of the Construction Contract.

1.4 Purpose of the Environmental Management Framework

This EMF identifies the proposed approach to managing environmental impacts associated with the design, construction and operation of the Project. The design and construction of the Project will be undertaken by a suitably experienced construction company, selected through the NTG's staged procurement process.

The construction company will be required to have a certified environmental management system (EMS) and prepare a CEMP that is consistent with this EMF to ensure that all regulatory and environmental requirements, including conditions and secondary approval conditions, are met. Environmental requirements have been explicitly specified in contract documents.

NTG will lease the Darwin Ship Lift Facility and it's operation to a suitably experienced Operator. The Operator will be required to submit an OEMP to NTG prior to commencement of operation that is consistent with this EMF to ensure that environmental obligations are met and impacts are adequately managed. Environmental requirements will be explicitly specified in contractual documents.

Following completion of the EIS process, further approvals and permits under NT legislation will be required for the construction of the and operation of the Project. These are anticipated to include the following approvals, as required under the Northern Territory *Planning Act 1999*:

- Development Permit for Industry General – General and Excavation and fill (Dredging and Reclamation Works)
- Dredge and Dredge Spoil Placement Management Plan
- Development Permit for Subdivision.

Imposed conditions and legislative requirements associated with these approvals and permits will be incorporated into subsequent EMPs. Legislative context and further approvals are discussed further in Chapter 3: Strategic and Statutory Framework of the Draft EIS.

1.5 Outline of the Environmental Management Framework

This EMF has been designed to be consistent with the AS/NZS ISO 14000 standards for environmental management. The EMF includes:

- roles and responsibilities
- inductions and training requirements
- incident, notification and emergency management requirements
- environmental objectives and performance criteria
- inspections monitoring, auditing and reporting requirements
- processes for dealing with a non-compliance and corrective actions
- complaints management requirements.

This framework includes proposed objectives, performance criteria, management and mitigation measures and monitoring and reporting requirements for impacts associated with the preliminary key

environmental factors and other environmental factors identified in the ToR for the Darwin Ship Lift EIS, or as part of the Project environmental risk assessment, technical studies and stakeholder consultations (refer Table 1). These include:

- Marine Environmental Quality
- Marine Flora and Fauna
- Air Quality and Greenhouse Gases
- Terrestrial Environmental Quality
- Terrestrial Flora and Fauna
- Surface Water and Hydrological Processes
- Human Health.

A separate SIMP is presented in Appendix C: Social Impact Assessment of the Draft EIS. The SIMP includes management and mitigation relating to social, economic and cultural surroundings.

Table 1 Factors, objectives, mitigation measures, monitoring and reporting

Component	Description
Environmental aspect	**Environmental aspect to be managed through the EMP Sub-plan**
Environmental objectives	**Targeted environmental outcomes to ensure that the requirements of the EA Act are achieved**. These reference the environmental factor objectives defined by the NT EPA (2018a).
Performance criteria	**Measurable goals or indicators of the environmental outcome.** Environmental objectives are deemed to be achieved if the performance criteria are met. If the performance criteria are not met, mitigation measures must be implemented to achieve the environmental outcomes.
Proposed mitigation measures	**Measures directed at achieving the environmental outcomes.** The proposed mitigation measures have been identified through the EIS process, based on the requirements of the ToR recognising that additional or different mitigation measures may be applied in order to achieve the environmental and social outcomes as the Project progresses. These mitigation measures have been applied to determine residual risk of proposed activities.
Monitoring and reporting requirements	**Monitoring and reporting requirements to demonstrate that the environmental objectives have been achieved, or corrective actions implemented, where applicable.**

DIPL's Standard Specification for Environmental Management (DIPL 2019) details the requirements for environmental management of projects. This includes guidelines for Construction Contractors on preparation of Contractor's Environmental Management Plans and other supporting plans (DIPL 2019). Contractors will be expected to implement the requirements of these specifications where relevant and environmental requirements are included in contractual documentation.

CEMPs and OEMPs will be developed in advance of relevant Project works. As the Project progresses, objectives, performance criteria and mitigation measures presented in this EMF will be refined by the successful Contractor, to ensure that an adaptive approach is taken to management of the Project. The EMPs developed by the Contractor for the Project will be reviewed by the DIPL Project Team, DIPL Environmental Consultant and independent external experts.

1.6 Proposed Supporting Documents

As stated above, the CEMP's and OEMP's will interact and cross-reference a suite of other documents that will guide the delivery of the Project. Documents that will be prepared by the Construction Contractor to guide the delivery of the Project include:

- Noise and Vibration Management Plan
- Traffic Management Plan (TMP)
- Erosion and Sediment Control Plan (ESCP)
- Marine Spill Response Plans
- Biosecurity Management Plan

Documents that have been prepared as part of the EIS process to guide the delivery of the Project include:

- A separate Draft DDSPMP has been prepared as part of the Supplementary EIS to guide the Construction Contractor's environmental management approach during preparation of the Final DDSPMP for regulatory approval.
- A Social Impact Management Plan (SIMP) to develop commitments to stakeholder engagement and to manage or mitigate or improve social and economic impacts (Appendix C of Appendix C: Social Impact Assessment of the Draft EIS).
- A Heritage Management Plan to inform the Construction Contractor of the protocol for the identification of human remains, artefacts of aboriginal origin, submerged artifacts or UXO (Appendix B to Appendix M: Cultural Heritage Assessment of the Draft EIS).

1.6.1 Noise and Vibration Management Plans

Prior to commencement of construction the Construction Contractor will be required to prepare a terrestrial Construction Noise and Vibration Management Plan (CNVMP) to support the CEMP.

The terrestrial CNVMP plan will identify:

- nearest residences, other sensitive land uses and ecological receptors such as, migratory birds
- approved hours of work and requirements for site specific noise risk assessments for proposed activities outside standard work hours
- all construction activities, including work areas, equipment and duration
- what work practices (generic and specific) would be applied to minimise noise and vibrations.

The terrestrial CNVMP will include, a complaint handling process, noise and vibration monitoring procedures, and an overview of community consultation required for identified high impact works.

Noise and vibration mitigation measures which will be considered in the CNVMP are detailed in Appendix K: Terrestrial Noise Impact Technical Report of the Draft EIS.

Management and monitoring measures to mitigate the potential for dredging-related underwater noise and vibration impacts upon protected marine species will be incorporated into a DDSPMP.

For piling, a Marine Noise and Vibration Management Plan will be developed by the piling contractor also for approval prior undertaking piling works.

It is anticipated that the requirements pertinent to underwater noise and vibration will be consistent between these plans and will include:

- equipment to be maintained and operated so as to reduce the generation of underwater noise and vibration level to as low as practicable
- surveillance by trained marine fauna observers of Observation and Exclusion Zones for protected marine species prior to commencement of dredging and piling operation, and periodically during operation
- mitigation measures to be implemented if adverse impacts upon protected marine species are detected
- reporting of observations of protected marine species.

1.6.2 Traffic Management Plans

Detailed TMPs will be prepared and approved for both the construction and operational phases. These detailed TMPs will be prepared and approved prior to construction works taking place or to the operation of the facility.

The Construction TMP should take into consideration the following components for the construction phase:

- haulage routes and circulation within the Project site
- requirement for traffic controllers
- community consultation
- dates and duration of construction
- access and egress to the construction site for triple road train manoeuvring
- compliance with driver facility legislation (i.e. required facilities such restrooms for drivers if appropriate).

The Operational TMP should take into consideration the following components for the operation phase:

- onsite parking requirements
- safe access and egress from the Project site
- safe passage from access road to parking area
- convenient and obvious ways to approach the entrance to the car park
- convenient and safe ways of circulating within the car park and advice about the location of pedestrian access to entrance doors
- safe routes to walk amongst or past parked cars to reach entrance doors.

Further information on traffic management measures are detailed in Appendix L: Traffic Impact Assessment of the Draft EIS.

1.6.3 Erosion and Sediment Control Plans

An ESCP will be prepared by a Certified Professional in Erosion and Sediment Control (CPESC) in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control (2008).

The plan will detail the following procedures and protocols:

- soil/land conservation objectives for the Project
- temporary/permanent erosion and sediment control measures
- workplace health and safety requirements relating to management of contamination and unexploded ordnance risk
- management of problem soils (e.g. acid sulfate soils, erosive, dispersive, reactive, acidic, sodic, alkaline soils)
- stockpiling and management/segregation of topsoil where it contains native plants seedbank or weed material
- vehicle, machinery and imported fill hygiene protocols and documentation
- requirements for training, inspections, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction.

This plan will be developed with reference to DIPL's Standard Specification for Environmental Management (DIPL 2019).

1.6.4 Marine Spill Response Plan

The Construction Contractor and Operation Contractor will be required to prepare and implement a Marine Spill Response Plan aligned with the NT (DIPL, Marine Safety Branch) and Darwin Port Oil Spill Contingency Plans (DoT 2014, Landbridge Darwin Port 2020).

These documents describe procedures and resource requirements to enable responders to take the actions required to minimise the environmental and economic effects of any marine pollution incident in NT waters through rapid, effective and appropriate response procedures (DoT, 2014).

1.6.5 Biosecurity Management Plan

Given the significance of the potential consequences of introduction of invasive marine pests it is recognised that it will be imperative to implement appropriate biosecurity mitigation and management measures during both construction and operations.

These measures will be aligned with the existing framework for reducing the risk of introduction of invasive species to Darwin Harbour (e.g. Darwin Port's Port Environment Protection Plan, INPEX's Operational Environmental Monitoring Program, NTG Aquatic Biosecurity Unit monitoring program) and with Australian national guidelines (e.g. DAFF 2009a,b, DAFF 2010, DAWR 2017).

Measures will be documented in a Biosecurity Management Plan, which will include quarantine procedures, vessel risk assessments and inspection protocols. The plan will be developed in consultation with the Aquatic Biosecurity Unit within the NT Department of Industry, Tourism and Trade to ensure consistency with existing quarantine arrangements for Darwin Harbour facilities.

The Biosecurity Management Plan will also include measures for managing weeds, mosquitoes and feral animals that might be transported to site via vehicles and vessels.

1.6.6 Draft Dredging and Dredge Spoil Placement Management Plan

The Construction Contractor will be required to prepare a Final DDSPMP, and have it approved by the NT EPA prior to the commencement of dredging operations. Development consent for dredging will also be required prior to the commencement of dredging operations.

A Draft DDSPMP has been developed to outline the approach to the management and monitoring of dredging operations and onshore placement of the dredged material and include a tiered response that is based on monitoring water quality in the vicinity of the operating dredge. Management and monitoring measures to mitigate the potential for dredging-related underwater noise and vibration impacts upon protected marine species has been incorporated the Draft DDSPMP as Protected Species Management Frameworks which include specific management objectives, targets, performance indicators, management measures, monitoring measures, reporting requirements, corrective actions and responsibilities.

The Final DDSPMP will be required to demonstrate that reasonable and practicable steps will be taken to manage the risks associated with, and the potential environmental impacts arising from, the dredging and dredged material placement activities to be undertaken during the Project dredging campaigns.

The DDSPMP also contains a suit of management measures to manage the impacts of dredging and piling. These relate to:

- Water Quality in Darwin Harbour (Draft DDSPMP Section 8.2)
- Water quality in the EAW settling ponds (Draft DDSPMP Section 8.3)
- Physical interactions with protected marine species (Draft DDSPMP Section 8.4)
- Underwater noise impacts on marine species (Draft DDSPMP Section 8.5).

1.6.7 Social Impact Management Plan

The Draft EIS SIMP summarises social, economic and cultural impacts and opportunities identified for the Project and outlines the proponent and Construction Contractor's required management plans for construction, and covers:

- impacts and opportunities from the perspective of the expected economic and social uplift of the Project

- social and cultural consequences for people positively or negatively affected by the Project.

The SIMP contains commitments to:

- communication and engagement during construction
- manage and mitigate social impacts
- strategies to capitalise on the social and economic benefits
- ongoing measurement against key indicators so progress can be monitored
- regular reporting of outcomes against key indicators
- implementing improvements to the SIMP as necessary.

The SIMP is intended to provide for a flexible, adaptive approach to identifying and responding to emerging issues.

Further information on the SIMP and details of specific impact management and mitigation measures are included in Chapter 10: Social, Economic and Cultural Surroundings and Appendix C: Social Impact Assessment of the Draft EIS.

1.6.8 Heritage Management Plan

Appendix N: Cultural Heritage Assessment of the Draft EIS includes a guide for the management of heritage values during the construction phase of the Project. This guideline describes the actions required by managers, contractors and employees in relation to unforeseen circumstances such as the discovery of:

- human remains
- artefacts of Indigenous origin
- submerged WWII artefacts
- UXO.

These circumstances are unlikely to occur as a pre-construction maritime surveys will be conducted for UXO and heritage artifacts, as such the risk to site personnel and heritage finds are considered low.

1.6.8.1 Heritage Interpretation Plan

The Proponent has also been liaising with the Heritage Branch to ensure the appropriate recording of heritage features within the Project footprint. The current works proposed will be completed before the construction of the Project and include:

- marine archaeology surveys, recording and analysis within the Project footprint before, during and after lifting of material on the seabed
- in consultation with LDC, public signage will be installed to memorialise the FBB and associated historical marine infrastructure in the Project footprint.

2.0 Construction Environmental Management

The successful Construction Contractor will be required to have a certified EMS and prepare a CEMP that is consistent with this framework to ensure that all regulatory and environmental requirements, including imposed conditions and secondary approval conditions are met. The CEMP will be developed with reference to DIPL's Standard Specification for Environmental Management (DIPL 2019), environmental requirements specified in design and construction contracts industry accepted practice and relevant guidelines and standards. The CEMP will be submitted to DIPL for review prior to commencement of construction works.

2.1 Key Roles and Responsibilities

Key roles and responsibilities will be confirmed by contractors on appointment and a Project-specific organisational chart will be developed and maintained by the contractors to ensure that adequate resources are available to meet the requirements of their EMS and the CEMP.

Site management responsibilities will be defined and documented by the Construction Contractor before works commence; these will include reporting and communication pathways between the Construction Contractor and DIPL personnel.

Key roles to be identified include (but are not limited to):

- Project Manager
- Health Safety Environment and Quality (HSEQ) Advisor
- Environmental representative
- supervisors/engineers
- employees and subcontractors.

An environmental representative must be on-site at all times when works are being undertaken. The environmental representative must have relevant experience and/or a certificate level qualification in Environmental Management for construction sites.

2.2 Inductions and Training Requirements

Inductions and training requirements will be determined by the DIPL and the contractors on appointment and will be in accordance with DIPL's and the contractor's policies and procedures. All relevant inductions will be completed by all personnel before they begin work on the Project. A training and inductions register will be maintained by the Construction Contractor.

2.2.1 Environmental Inductions

All Project personnel will be required to attend an induction session to inform them of their responsibilities under the CEMP. Short-term site visitors and contractors will also be required to undertake a Visitors Induction and will be required to be accompanied by inducted personnel at all times.

The induction will likely include:

- CEMP requirements
- environmental approval conditions
- statutory duties about notification of environmental harm
- environmental incident notification procedures which will include how an event is reported and to whom the event is reported (all incidents are to be reported, including near misses)
- emergency procedures which will cover the procedure for an emergency and for evacuation of the site in the event of a catastrophic situation arising
- contingency plans (e.g. for hydrocarbon or chemical spills)

- environmental data collection and documentation requirements
- complaints management procedures
- key environmental risks and issues
- location of sensitive receptors and culturally and environmentally sensitive areas
- cultural awareness training
- hours of operations
- key environmental and emergency contacts.

2.2.2 Environmental Awareness

A variety of tools will be used to further increase awareness of significant environmental and safety issues, and to communicate the relevant requirements documented in environmental and safety management plans. These may include:

- daily prestart meetings
- toolbox meetings
- safety/risk assessments
- management meetings
- noticeboards
- environmental incident investigations/reports.

Typical items discussed in daily, toolbox and management meetings will include environmental items such as new procedures or reinforcement of existing procedures, handling of hazardous chemicals, management of waste/recycling, and the need to report all incidents and hazards/near misses.

It is also envisaged that these mechanisms will provide a vehicle for promoting adaptive management and encouraging the workforce to identify opportunities for continuous improvement.

2.2.3 Training

Only suitably qualified and experienced personnel will be engaged on the Project. All personnel will have appropriate qualifications and experience for their role on the Project.

Additional training for personnel may be required depending on the Project stage, the tasks to be undertaken and their level of responsibility. A training register will be developed and maintained that identifies requirements in relation to qualifications, competencies and Project-specific training courses.

The Construction Contractor's Environmental Policy or EMS shall commit them to providing sufficient and suitable resources and training to achieve the targets defined in its EMS and the CEMP, as appropriate.

2.2.4 Incidents, Notifications and Emergencies

In the NT, the EP Act and the *Waste Management and Pollution Control Act 1998* legislate obligations and duties to prevent environmental harm, environmental nuisance and contamination.

The two primary duties that apply to everyone in the NT are:

- General environmental duty – which means a person must not carry out any activity that causes or is likely to cause environmental harm, unless measures to prevent or minimise the harm have been taken.
- Duty to notify of environmental harm – to inform the administering authority and landowner or occupier when an incident has occurred that may have caused or threatens serious or material environmental harm.

All staff and contractors are required to report all environmental incidents or breaches of the approval conditions in accordance with statutory requirements and the timeframes that will be specified in the CEMP.

Project specific incident management procedures will be developed to detail the processes and resources required to respond and manage incidents through to resolution during construction.

Incidents shall be tracked through to closeout using an incident tracking system or register. Complaints will be investigated by the Project management team and action will be taken to enable satisfactory closeout.

Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated DIPL representative and to NT EPA Pollution Hotline (1800-064-567) or, for marine fauna incidents, Marine Wildwatch line (1800-453-941) as soon as practicable and in any case within 24 hours.

When in any doubt as to the seriousness of the event, the Construction Contractor will notify the authorities, in liaison with DIPL. DIPL will also be notified of any notices received from authorities.

2.2.5 Environmental Documents and Records Management

The Construction Contractor will develop or implement a document management system that fulfils requirements to operate under their EMS before the commencement of site works.

Project records, including subcontractor Project records, will be maintained to provide evidence of conformity to DIPLs requirements and commitments in the CEMP.

Such records should at a minimum include the following:

- correspondence to/from DIPL and interested parties including minute of meetings (where relevant)
- permits, licenses and approvals
- induction and other training records
- environmental procedures and plans
- inspection, monitoring and test documentation (including calibration)
- non-conformance and corrective action/complaints
- environmental incidents
- audits and inspections
- daily monitoring site records
- delivery/waste dockets.

2.2.6 Performance Management

Performance management includes activities to ensure that goals and objectives are consistently being achieved in an effective and efficient manner. A key component of the environmental management process is the development and implementation of specific measures to ensure that the environmental risks arising from Project activities are minimised.

2.2.7 Environmental Objectives

The environmental objectives for preliminary key environmental factors have been defined by the NT EPA. Wherever possible, these objectives should be incorporated into the contractor's CEMP. Draft objectives have been included in Section 2.3. These will be confirmed by the contractor in consultation with DIPL as part of development of the CEMP.

2.2.8 Performance Criteria

Similarly, performance criteria will be incorporated into the Construction Contractors CEMPs to assess the effectiveness of mitigation measures and allow for continuous improvement of environmental management. Draft performance criteria have also been included in Section 2.3. Key performance indicators (KPIs) will be defined by the successful Construction Contractors in consultation with DIPL. Where performance criteria are not met, this will form a trigger for review of the CEMP and initiate corrective actions specific to the scenario.

General KPI's are likely to include:

- all personnel working on site have undergone an environmental induction
- internal audit score of 100% compliance with the CEMP
- DIPL conducted audit score of 100% for compliance with the CEMP
- regulator conducted audit (if applicable) score of 100% for compliance with the CEMP
- no activity in breach of the provisions of any environmental legislation and Project environmental approval conditions
- 100% investigation and reporting of any environmental incident at the Project site
- 100% compliance required for management measures relating to dredging and dredge spoil management.

2.2.9 Inspections, Monitoring, Auditing and Reporting

Inspections, monitoring, auditing and reporting will be developed and undertaken to document compliance with approval conditions, commitments and the requirements of the CEMP.

2.2.9.1 Inspections/Monitoring

Daily site and facilities inspections will be conducted by site supervisors. These inspections will focus on ensuring compliance with approval conditions, commitments and the CEMPs. Monitoring will be undertaken in accordance with the CEMP and other supporting management plans (refer Sections 1.6 and 2.3).

If required, any monitoring equipment should be maintained and calibrated in accordance with manufacturers guidelines to ensure reliability of equipment and data. Sampling should be undertaken by a National Association of Testing Authorities (NATA) accredited laboratory unless otherwise stated. Monitoring data and results will be maintained in a database, with results reviewed, interpreted and reported in accordance with the developed monitoring and reporting requirements and timeframes.

If monitoring or inspections indicate that activities are not in compliance with approval requirements or the CEMP, necessary corrective actions will be implemented, and authorities informed where applicable and/or in accordance with approval conditions or legislative requirements.

Any corrective actions resulting from inspections will be entered onto a ‘Non-conformance and Corrective Action Register’ and the progress tracked and closed out upon completion.

2.2.9.2 Internal Audits

An internal audit of the CEMP will be undertaken prior to commencement of works to assess its likely effectiveness and to identify any opportunities for improvement.

A second internal audit of the CEMP will be undertaken three months after the commencement of site activities to assess the effectiveness of the implementation of the CEMP, and of the monitoring and reporting procedures being applied. The intent of this audit will be to identify any opportunities for improvement to ensure monitoring, reporting and record keeping are sufficient to support required reporting.

2.2.9.3 External Audits

External audits can be conducted by DIPL or third parties, such as other government departments and Authorities. The NTG may conduct an audit at any time when they believe there is an issue in relation to environmental compliance. The Construction Contractors will assist with any external audit.

Results from any external audits will be reviewed by the Construction Contractor, with any necessary corrective actions assigned to Project personnel to ensure appropriate and timely closeout. Any corrective actions will be entered into a corrective action register and the progress tracked to completion.

2.2.9.4 Project Corrective Action Register

Any environmental non-conformance (e.g. incidents, audit-related non-conformance, complaints, government notices) will be recorded in a Project corrective actions register or similar to be developed by the Construction Contractor. The corrective actions register will detail the non-conformance, the

corrective action required, the responsible person(s), the timeframes by which the action is to be completed, and the actual completion date. Each non-conformance will be reviewed, and it will be established if there are any actions available to reduce the severity or likelihood of re-occurrence.

2.2.9.5 Reporting

During construction, a monthly compliance report will be prepared for the DIPL by the Construction Contractor. The report would be expected to include:

- summary of environmental inspections
- summary of monitoring data and interpretation of results
- details of environmental non-compliance events or incidents
- reporting of complaints including a description of the issues, responses and corrective actions.

An Annual Environmental Report will be prepared for each year of construction that will should at a minimum include the following:

- a statement of compliance with the approval conditions
- evaluation of compliance with the CEMP
- summary of non-compliance events
- relevant trends and interpretation against performance criteria for each environmental aspect.

2.2.10 Complaints Management

The Construction Contractor will develop a Complaints Management Procedure to ensure that complaints are dealt with efficiently and effectively, and stakeholders have confidence in the complaints management system.

Complaints can be lodged by stakeholders or any member of the community. Should a complaint be made it will be recorded in a complaints register with details of the date, location, and contain details of the complainant and follow up actions required.

All complaints will be investigated thoroughly to ensure appropriate corrective actions are taken to resolve any issues as appropriate. They will also be recorded and tracked via monthly and annual compliance reports to be prepared by the Construction Contractor (refer Section 2.2.9.5).

DIPL will regularly monitor the quality and effectiveness of the complaints management system and revise relevant components where appropriate based on feedback from internal and external sources.

2.3 Environmental Factor Management Measures

Mitigation and monitoring measures have been developed for each of the preliminary key environmental factors identified in the ToR as well as other factors identified during the risk assessment, technical studies and stakeholder engagements. For each factor or aspect identified, environmental objective and performance criteria have also been defined as outlined in Table 1.

Proposed management measure that will need to be considered during detailed design and construction are presented below under the following factor headings to maintain consistency with the structure of the technical chapters within the Draft EIS (Chapters 7 through 11 of the Draft EIS):

- Marine Environmental Quality
- Marine Flora and Fauna
- Air Quality and Greenhouse Gases
- Terrestrial Environmental Quality
- Terrestrial Flora and Fauna
- Surface Water and Hydrological Processes
- Human Health.

2.3.1 Marine Environmental Quality

Table 2 Marine environmental quality construction management measures

Environmental objectives	***Protect the quality and productivity of water, sediment and biota so that environmental values are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • Audit score of 100% compliance on any audits of hazardous goods storage and handling requirements. DDSPMP performance criteria - Dredging • Number of instances of exceedance of water quality monitoring criteria (trigger levels) at the sampling locations 150 m down-current from the sources that require corrective actions to be implemented to return water quality in East Arm to an acceptable level. • Number of instances in which monitoring of hard coral and filter feeder communities at South Shell Island and Catalina Islands monitoring sites is triggered. DDSPMP performance criteria - EAW settling ponds • Number of instances when pH or bioavailable toxicant concentrations are outside of acceptable guidelines (pH <6.0; bioavailable toxicant concentrations >ANZG DGVs) in Pond E (north), prior to discharge into Pond E (south). • Number of instances when SSC at the weir box between Pond E (north) and Pond E (south) is >100 mg/L (measured as turbidity), • Number of instances when target criteria 4 (a)-(d) are not met.
Proposed mitigation measures	
• Preparation and implementation of DDSPMP, approved by regulatory bodies, which includes a tiered response plan that is based on monitoring water quality in the vicinity of the operating dredge. Specific management measures relate to the two options (Option 1 and Option 2) of dredging for the Project are discussed further in Section 8.2 of the Draft DDSPMP for the Project and include: *Cutter Suction Dredge* • Cutter head and pump speeds managed to minimise dispersion of fine sediments from the cutter head. • Pipeline integrity maintained to reduce the potential for spoil leakage from joints between sections. • deployment of silt curtains. *Back Hoe Dredge* • Speed of bucket movement through water column managed to minimise loss of sediments into the water column. • Minimal overflow from barges. • Silt curtains along seaward edge of reclamation area. • Management of runoff from reclamation area. *Corrective Actions* • Slowing the CSD cutter head speed or slew speed of the dredge, reducing the rate of disturbance at the cutter head (Option 1). • Repairing pipeline joints to eliminate leakage of spoil (Option1). • Slowing the speed of raising the BHD bucket through the water column (Options 1 & 2). • If necessary, reducing or suspending dredging activity during certain tidal periods when the migration of dredge plumes towards South Shell Island and Catalina Island is greatest. • Relocating the dredge to an alternate dredge face. • Temporary cessation of dredging. • Use of silt curtains during reclamation activities to remove silt from runoff prior to, and within, the marine environment. *Tailwater* • Tailwater mitigation measures are detailed in Section 8.0 of the Draft DDSPMP and in Section 3.6.2 of the Supplementary EIS. The process to mitigate supernatant tailwater involves the use of the dredge settlement ponds at East Arm Wharf. - Tailwater will flow from the dredge spoil that has been deposited in Pond K towards Pond E (north). Larger sediment particles will drop out as the tailwater progresses.	

	- The flow of tailwater into Pond E (north) is via a weir box. At this location, the flow of tailwater can be regulated. Monitoring of water quality will also be undertaken at this point. - Tailwater in Pond E (north) can be controlled via the weir box leading to Pond E (south). Additionally, a series of silt curtains can be placed across Pond E (north) to ensure sufficient deposition of finer particles occurs prior to tailwater moving to Pond E (south). - Tailwater can be monitored at the weir box before it enters Pond E (south). Additional silt curtains can be placed within Pond E (south) to further improve the quality and ensure compliance of any tailwater exiting Pond E (south) into Darwin Harbour. Should an exceedance be detected at the weir box between Pond E (north) and Pond E (south), flow of tailwater into Pond E (south) will be stopped at the weir, halting discharge of the tailwater into Darwin Harbour. If required further silt curtains will be installed within Pond E (south) to ensure the water exiting the pond is at an acceptable quality. - Tailwater discharge from Pond E (south) is via a permeable section of the permeable bund wall which is layered with a geotextile fabric providing an additional filtration point of water entering Darwin Harbour. *ASS* • Preparation and implementation of a CEMP including: - ASS management plan reflecting national standards and current best practice - ESCP. • Adoption of suitable construction methodologies to minimise mud waving. ASS management associated with placement of dredged material will be incorporated into the DDSPMP, with management based on National ASS Guidelines. *Other mitigation measures* • Construction methodologies developed to contain reclamation material. • Soil contamination investigations completed during preparation of the Draft EIS to determine level of contamination and remediation (refer to Draft EIS Appendix N: Preliminary Site Investigation) • Unexpected finds protocol (ASS and contamination). • Engaging with Port of Darwin regarding the Port Environmental Protection Plan. • Preparation and implementation of a Marine Spill Response Plan in line with the existing Darwin Port Oil Spill Contingency Plan. The plan will also reference the NT (DIPL Marine) OSCP. • Compliance with AS1940-2004 (Storage and handling of flammable and combustible liquids). • Preparation and implementation of a refuelling management plan. • Spill kits to be located at suitable locations on site during construction and operation and appropriate personnel trained in use.
Monitoring and reporting requirements	*DDSPMP requirements – Dredging* • Monitoring - Following a visual assessment, if required, water quality monitoring 150 m down-current of the operating dredge, the pipeline (under Option 1; if a plume is emanating from it) and the reclamation area. - Review of daily satellite images. - Baseline and post-dredging assessments of proportions of live hard corals and filter feeders within benthic communities at Catalina Island and South Shell Island monitoring sites. - If required due to exceedance of turbidity trigger levels at 150 m down-current from sources, assessment of hard coral and filter feeder communities at South Shell Island and Catalina Island monitoring sites. • Reporting - Daily reporting of monitoring data by Dredging Contractor to the Proponent. - Monitoring report to the NT EPA at the conclusion of dredging. - Trigger level exceedances 150 m down-current of any sources of turbid plumes from the dredging and reclamation activities will be reported by the Dredging Contractor to the Proponent within 24 hours of the exceedance occurring. - A report on corrective actions implemented to address the cause of the exceedance will be submitted by Dredging Contractor to the Proponent within two business days of the notification. - Dredging Contractor will notify the Proponent of the outcome of their investigation into attributability of the exceedance to dredging within three business days of the notification.

	- Dredging Contractor will notify the Proponent of the outcomes of any monitoring of the Catalina Island and South Shell Island benthic communities that is triggered by turbidity level exceedances; this will be provided within five business days of completion of the monitoring. *DDSPMP monitoring and reporting requirements – EAW settling ponds* • Monitoring - Water quality monitoring within ponds – pH, toxicants, NTU as detailed in Section 9.4 of the DDSPMP. - Visual monitoring of target criteria 4 (a)-(d) outside the permeable section of railway bund (during the water quality monitoring events). • Reporting - Weekly reporting of data to the Proponent. - Monitoring report to the Proponent at conclusion of dredging and reclamation. - Trigger levels are detailed in Section 9.6 of the DDSPMP. Trigger level exceedances at any monitoring location will be reported to the Proponent within 24 hours of the exceedance occurring. - Should a trigger level exceedance occur in Pond E (north) at the weir into Pond E (south), this will be reported by Dredging Contractor to the Proponent within 24 hours of the exceedance occurring and a report on corrective actions implemented to address the cause of the exceedance provided within five business days of the notification *Other monitoring and reporting requirements* • Event triggered sediment and water quality sampling frameworks will be implemented in the event of an unplanned release of a pollutant. • All routine reporting will be reported in daily site environmental reports. Where an exceedance is detected, this will be communicated by the Construction Contractor to the proponent within 24 hours and an attributability assessment undertaken. A report on the attributability will be provided to the Proponent within a suitable timeframe to be determined in the DDSPMP and CEMP. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated DIPL representative and to NT EPA Pollution Hotline (1800-064-567) within 24 hours.

2.3.2 Marine Flora and Fauna

Table 3 Marine flora and fauna construction management measures

Environmental objectives	***Protect marine flora and fauna so that biological diversity and ecological integrity are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site.
Proposed mitigation measures	
Dredging and Dredge Spoil Disposal • Preparation and implementation of DDSPMP, including monitoring and adaptive management protocols to reduce risk of impacts to: - benthic communities from turbidity and sedimentation - protected marine species from physical interaction and underwater noise • It is considered that the South Shell Island and Catalina Island benthic communities are sufficiently distant from the predicted Zones of Impact and Influence from the dredging and reclamation activities and that the mitigation measures to reduce the dredge plume provided in the Marine Environmental Quality section above are appropriate to reduce the potential impacts on benthic communities at South Shell Island and Catalina Island, however monitoring of these islands benthic communities is included within the DDSPMP to meet the expectations of the regulators responsible for approval of the DDSPMP. *Protected Species Management Frameworks* A series of Protected Species Management Frameworks (PSMF) have been developed in Section 9.0 of the Draft DDSPMP for physical vessel interactions, and underwater noise. Species specific PSMFs developed for species identified as part of the EPBC referral are discussed in Section 2.4: • Physical interactions - Training of Vessel Masters in interaction procedures - During movements of Project vessels, if protected marine species are sighted within 50 m of a vessel then avoidance actions will be taken by the vessel (e.g. change of direction or slowing to less than 6 knots) until the individuals are no longer within this distance. - Vessels will adhere to Darwin Port speed restrictions. - Vessels will not approach, circle or wait in front of protected marine species for the purposes of casual viewing. - Support vessels will not approach, circle or wait in front of wildlife for the purposes of casual viewing. • Underwater noise - Marine Fauna Observer (MFO) to undertake assessments of the Observation, Start-up Exclusion and Dredging Response Zones as follows. - On each occasion that the dredge has been non-operational for a period exceeding 30 minutes, a visual assessment will be undertaken of the 750 m radius Observation Zone by the MFO for a period of 20 minutes. Dredging will not recommence until no protected marine species have been sighted within the 500 m radius Start-up Exclusion Zone for a period of 10 minutes. - The assessment of the Observation Zone will be made from an elevated position on the dredge, where a clear line of sight is achievable to the edge of the zone. - The MFO will not be engaged in any other activities during the 20-minute assessment period. - Every 30 minutes whilst the dredge is operating, the MFO will dedicate a period of five minutes for scanning (from an elevated position) for protected marine species within the Observation Zone. - Once dredging operations have commenced, if protected marine species enter within 50 m of the dredge, or a dolphin with calf enter within 150 m of the dredge (i.e. the Dredging Response Zones), then dredging will be temporarily suspended. Dredging will not recommence until no protected marine species have been sighted within the 500 m radius Start-up Exclusion Zone for a period of 30 minutes. - Dredging that commences prior to sunset, or prior to a period of low visibility (defined as where continuous visual observations to a distance of 1000 m from the dredge are not possible), will continue unless, within the preceding 12 hours, there have been three or more **suspensions of** dredging due to protected marine species encroaching within the Dredging Response Zone. - The generation of underwater noise by all vessels will be reduced by ensuring that:	

	▪ All equipment is maintained in good operating condition (balancing, greasing, etc.) and have proper noise control systems in place. ▪ All noise minimisation measures such as mufflers, special enclosures and sound-insulation mounts are fitted and working. ▪ Revolving equipment such as propellers and drive shafts are balanced to reduce vibration. ▪ Equipment such as thrusters and auxiliary plant are switched off when not in use (i.e. not running in standby mode**).** • Implementation of no-go zones around the AAPA restricted areas of South Shell Island and Catalina Island. • Preparation and implementation of a Marine Noise and Vibration Management Plan, incorporating marine fauna observations and adaptive management protocols. • Preparation and implementation of a CEMP containing an Erosion and Sediment Control Plan, and a stormwater management plan and spill response measures. • Compliance with AS1940-2004 (Storage and handling of flammable and combustible liquids). • Preparation and implementation of a CEMP containing an ASS Management Plan. • Preparation and implementation of a Marine Spill Response Plan aligned with the NT (DIPL, Marine Safety Branch) and Darwin Port Oil Spill Contingency Plan. • Implementation of vessel speed limitations aligned with Darwin Port Harbourmaster requirements. • Implementation of standard navigational procedures and navigation aids. • Stormwater retention and treatment systems incorporated into Project design. • Reduction of light spill into marine environment from vessels and infrastructure to as low as practically possible through the implementation of lighting in accordance with the National Light Pollution Guidelines for Wildlife (DEE, 2020). • Preparation and implementation of a Biosecurity Management Plan, including vessel risk assessment and inspection protocols. • Consultation with the Aquatic Biosecurity Unit within the NT Department of Industry, Tourism and Trade to ensure consistency with existing quarantine arrangements for Darwin Harbour facilities.
Monitoring and reporting requirements	*Draft DDSPMP Benthic Habitats - South Shell Island and Catalina Island* • Fortnightly monitoring of the benthic communities at the South Shell Island, Catalina Island and Channel Island sites will be initiated. • Monitoring will continue over four fortnightly periods following the positive attributability assessment. It is recognised that elevated turbidity levels at the South Shell Island and Catalina Island sites are unlikely to result in immediate changes to benthic community health, but that indications of reduced health may become evident over time. • If the monitoring does not indicate any trend in decreasing health of the benthic communities at the monitoring sites (as indicated by increasing stress or mortality of hard corals or filter feeders), and there have been no further positive attributability assessments over the monitoring period, then monitoring will be suspended. *Draft DDSPMP* PMSF – Dredging • Monitoring - Watch will be maintained for stranded, injured or dead protected marine fauna; if observed, the NT Government Marine Wildwatch line (1800-453-941) will be contacted for retrieval, treatment or post-mortem of the fauna. • Reporting - Daily submission of marine fauna observations sheets by Dredging Contractor to the Proponent - Weekly summary reporting by Dredging Contractor to the Proponent of number of sightings, incidents and corrective actions. - Monitoring report to the Proponent at the conclusion of dredging. - Any vessel interaction incidents and protected species injury or mortality will be reported to the Proponent within 24 hours of the incident occurring. The Contractor and/or Proponent will also notify the NT EPA and DAWE. *Draft DDSPMP PMSF – Underwater noise* • Monitoring - Watch will be maintained for the presence of stranded, injured or dead protected marine species. If observed, the NT Government Marine Wildwatch

	line (1800-453-941) will be contacted for retrieval, treatment or post-mortem of the animal(s). • Reporting - Daily submission of marine fauna observations sheets from Contractor to the Proponent. - Weekly summary reporting to Proponent of number of sightings of protected marine species. - Monitoring report to the Proponent at the conclusion of dredging. - Any suspected noise-related incidents will be reported by Contractor to Proponent within 24 hours of the incident occurring. - Any corrective actions implemented in response to suspected noise related incidents will be detailed in the weekly report to Proponent. • Monitoring of Observation and Shut-down zones around dredging and piling operations, to mitigate the potential for impacts upon protected marine species. • Reporting of protected marine species observed during dredging and piling operations. • Vessel risk assessment and inspection protocols as per requirements of Biosecurity Management Plan. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated DIPL representative and to NT EPA Pollution Hotline (1800-064-567) or, for marine fauna incidents, Marine Wildwatch line (1800-453-941) within 24 hours.

2.3.3 Air Quality and Greenhouse Gases

Table 4 Air quality and greenhouse gases construction management measures

Environmental objectives	***Maintain air quality and minimise emissions and their impact so that environmental values are protected.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • No complaints from stakeholders or the community regarding dust or air quality.
Proposed mitigation measures	
Air Quality • Develop and implement a Construction Air Quality Management Plan specific to the Project, to be incorporated into the CEMP, prior to the start of construction activity. • Ensure stockpiles are covered and dust suppression technologies are added to handled material where required • Inform adjoining neighbours of intended construction activities. • Limit the intensity of the movement of dusty materials and construction work such as earth moving during periods of high wind, or deploy added dust suppression efforts. • Use a water truck to regularly apply water to unsealed roads or vehicle paths that are in use. At minimum, application of water at a rate of up to 2 litres per square metre per hour (L/m2/h) is required. • Regularly and lightly water dust-prone areas, ensuring not to over-water areas as it can cause damage and erosion. This is recommended for stockpiles and unsealed areas. • Minimise drop heights of materials (e.g., from loaders into tipper trucks). • Removal of topsoil and the importing or storing of soil and other materials must be done with due care to minimise dust. • Seal permanent roads and areas planned to be sealed as soon as practicable. • Cover materials during transport to and from the Project site. • Limit travel speed on site noting that slower speeds produce less dust. Travel speeds in excess of 10 km/h are not recommended on unsealed areas or paths. Speed limits should be sign-posted. • Operate machinery, equipment, vehicles, dredges and support vessels efficiently to minimise exhaust emission. • Clean up residues and spills in a timely manner. *Greenhouse gas* • Maintain equipment and vehicles to ensure engine efficiency and use fuel efficient equipment where able. • Reduce travel distances off-site by sourcing imported materials from local areas. • Reduce travel distances on-site by planning internal haul roads and staging of related activities efficiently. • Minimise idling time of plant and equipment and switch engines off when not in use. • Look for opportunities to add vegetation; where possible and plant species selected should be both drought tolerant and fast growing. • Where possible prioritise the selection and use of electric equipment (over fuel combustion engines). • Recycle any waste produced where feasible.	
Monitoring and reporting requirements	Air quality impacts at sensitive receptors due to construction and operation of the Project are not predicted to be significant due to the separation distance between the Project and sensitive receptors. Sensitive receptors are well outside the recommended separation distances listed in NT EPA *Guideline: Recommended Land Use Separation Distances* (2017). Based on the result of the assessment, no air quality monitoring is deemed to be required for the construction phase of the Project.

2.3.4 Terrestrial Environmental Quality

Table 5 Terrestrial environmental quality construction management measures

Environmental objectives	***Maintain the quality of land and soils so that the environmental values are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • Audit score of 100% compliance on any audits of hazardous goods storage and handling requirements.
Proposed mitigation measures	
• Water runoff and infiltration to be aided by designed drainage. Appropriate filtering of gross pollutants before discharging from the site. • Wastewater to be appropriately treated and managed prior to release. Waste management programs which includes a routine waste management program for all waste management systems. • An unexpected finds procedure to identify and manage contaminated materials and ASS that may be encountered during construction. • ASS Management Plan reflecting national standards and current best practice. • Clearing of the mangrove area will be undertaken by cutting the trees at the base and then removing the vegetation for mulching and reuse on the site for erosion and sediment control. The root ball of the mangroves will not be disturbed during this process. • Materials will be recycled wherever possible. • Waste will be segregated by type on site and collected on a regular basis by a suitably licenced contractor and disposed of at a licenced landfill and recycling facilities where applicable. • Waste oil will be stored in an appropriate fuel storage bund prior to transportation for appropriate disposal. • Littering on site is prohibited and work and office sites are to be kept clean and tidy. • Rubbish containers are to be provided at all work sites. • Waste management requirements will be addressed in site inductions. • Routine maintenance program will be developed for all waste management systems including wastewater management systems. • All hazardous and dangerous goods will be handled and stored according to the Australian Standards. • Minimise use of hazardous materials where possible and use alternatives where feasible. • Delivery of hazardous materials will be in line with site use to avoid the need to store significant quantities. • Contaminated runoff and contaminated soil will be collected and remediated or transported to a suitable facility for disposal.	
Monitoring and reporting requirements	• Weekly inspections of the site will be conducted. • Inspections of waste and wastewater management systems will be undertaken as per manufacturer requirements. • Volumes of waste material and recycled material will be reported via the Annual Report to DIPL. • Inappropriate waste disposal will be reportable as an incident as per the Construction Contractors incident reporting processes. • Inspections of storage tanks and bulk containers and the integrity of bunded areas, pavement and associated containment systems will be conducted on a monthly basis. • Regular review of handling, storage and use will be undertaken and alternatives will be identified where feasible. • The results of the hydrocarbon and hazardous management program will be documented by the Construction Contractor in the sites Annual Report to DIPL. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated DIPL representative and to NT EPA Pollution Hotline (1800-064-567) within 24 hours.

2.3.5 Terrestrial Flora and Fauna

Table 6 Terrestrial flora and fauna construction management measures

Environmental objectives	***Protect the NTs flora and fauna so that biological diversity and ecological integrity are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site.
Proposed mitigation measures	
• Management practices to prevent the introduction and spread of weeds and pests during construction will be managed through mitigation measures administered under the CEMP. This will be linked to the Biosecurity Management Plan as appropriate to prevent the introduction of weed or feral/pest species via vessels as appropriate. • Adoption of suitable construction methodologies to minimise impacts from pile driving noise, including monitoring and adaptive management protocols to reduce risk of impacts to protect fauna from noise impacts during construction. • Develop and implement a CNVMP to support the CEMP. • Develop and implement species specific environmental management measures to ensure that impacts to identified EPBC Act listed species are avoided or mitigated (Section 3.0).	
Monitoring and reporting requirements	• Weekly site inspections. • Reporting on environmental incidents including incursions of weed, pest and feral species. • Weed and pest monitoring as required in CEMP and Biosecurity Management Plan.

2.3.6 Surface Water and Hydrological Processes

Table 7 Surface water and hydrological processes construction management measures

Environmental objectives	***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.*** ***Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site.
Proposed mitigation measures	
• Project design to incorporate stormwater outfall structures with appropriate low velocity minimisation and energy dissipation measures. • Adopt suitable construction methodologies to contain reclamation material. • Ensure that on-site activities are carried out by such practicable means necessary to minimise the contact of incidental rainfall and stormwater runoff with wastes or other contaminants. • Develop and implement an ESCP for areas to be disturbed during construction. • Develop and implement a Final DDSPMP. • Install operate and maintain stormwater drainage system and stormwater treatment devices • Implement spill and leak prevention and control techniques for land-based activities. • Ensure appropriate spill kits are available and provide training on kit use. • Ensure spillage of wastes, contaminants or other materials are cleaned up as quickly as practicable using procedures that prevent contaminants or material being transferred to the stormwater drainage system. • Implement bunded areas and drainage lines separate from the stormwater drainage in chemical storage and handling areas to reduce the likelihood of chemical contamination of stormwater.	
Monitoring and reporting requirements	• Weekly inspection of stormwater system and drains. • Monitor and manage surface water from within the reclamation and material handling areas to meet appropriate water quality criteria before it is allowed to discharge to the marine environment. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated DIPL representative and to NT EPA Pollution Hotline (1800-064-567) or, within 24 hours.

2.3.7 Human Health

Table 8 Human health construction management measures

Environmental objectives	***Ensure that risks to human health are identified, understood and adequately avoided and/or mitigated.***
Performance criteria	• 100% investigation and reporting of any environmental incident at the site. • No noticeable increase in biting insect populations and no Project related complaints from biting insects. • No observed ponding/breeding sites within the Project footprint.
Proposed mitigation measures	
• Designs and stormwater management plans to include a drainage strategy that prevents water from ponding and becoming a breeding site. • Develop and implement a Biting Insect Management Plan in accordance with NT Department of Health Guidelines. • Monitor impacts associated with disposal of dredge spoil to land (if required). • Ensure Biosecurity Management Plan includes requirements in relation to mosquitoes and international health regulations. • Cultural Heritage Assessment (Draft EIS Appendix M: Cultural Heritage Assessment) including liaison with NT Heritage Branch regarding UXO surveys undertaken to date. • UXO risk assessment will be undertaken prior to construction works. • UXO to be incorporated into the unexpected finds procedure.	
Monitoring and reporting requirements	• If Darwin Port settlement ponds are utilised during construction, a biting insect surveillance program will be developed and implemented as part of the dredge management program to ensure mosquito breeding is detected and controlled. Results of the biting insects management and surveillance program will be reported to DIPL. • Site inspections to identify potential breeding sites. • Any significant mosquito activity will also be reported to DIPL and/or the Medical Entomology Branch and monitored if risks to human health are identified. • If UXO are found in the Project area DIPL and the NT Police should be contacted as per the unexpected finds procedure.

2.4 Detailed Protected Species Management Framework

As part of the EPBC Referral a Request for Further Information was received from the Department of Agriculture Water and the Environment (DAWE) to detail avoidance and management measures for the following identified matters of national environmental significance (MNES):

- Threatened and migratory shorebirds
- Flatback turtle
- Migratory dolphins.

These detailed Protected Species Management Frameworks (PSMF) are presented below and ordered to respond to potential impacts identified through the Draft EIS. These PSMFs will be used to further inform construction environmental management plans to avoid and mitigate impacts on MNES.

2.4.1 Noise, Light and Vibration

The following PSMF relates to managing the potential impacts resulting from terrestrial noise, light and vibration during the construction and operation of the Project potentially impacting on threatened and migratory shorebirds, flatback turtle, and migratory dolphins (Table 9).

Table 9 Protected Species Management Framework - Noise, Light and Vibration

Protected Species Management Framework – Noise, Light and Vibration	
Element	Impacts on protected marine species from construction activities.
Objectives	• Minimise the risk of disturbance to protected marine species from construction noise, light and vibration. • Establish and maintain awareness of the importance of protecting listed species.
Targets	• Compliance with the mitigation measures identified in the Construction Noise and Vibration Management Plan, Dredging and Dredge Spoil Placement Management Plan and Piling Management Plan. • Light spill into the marine and terrestrial environment in accordance with *National Light Pollution Guidelines for Wildlife* (DEE, 2020). • All construction personnel to complete an HSE induction that details responsibilities to minimise light, noise and vibration impacts • Investigate all environmental incidents at the site relating to excess lighting, noise, or vibration
Key Performance Indicators	• Number of audits and incident reports. • Number of reported sightings of live, injured or dead protected marine species including shorebirds, turtles and dolphins. • Number of personnel completing an HSE site induction.
Management	• Development of a Construction Noise and Vibration Management Plan identifying: - nearest residences, other sensitive land uses and ecological receptors such as, migratory birds - approved hours of work and requirements for site specific noise risk assessments for proposed activities outside standard work hours - all construction activities, including work areas, equipment and duration - what work practices (generic and specific) would be applied to minimise noise and vibrations. • Development of a Piling Management Plan including Commencing pile driving (any time when pile driving has ceased for a certain period) with the "soft start" procedure, where pile driving impact force will be gradually scaled up over a five-minute period. • Reduction of light spill into marine and terrestrial environment from vessels and infrastructure to as low as practically possible in accordance with the *National Light Pollution Guidelines for Wildlife* (DEE, 2020).
Monitoring	• Weekly site inspections.

Protected Species Management Framework – Noise, Light and Vibration	
Reporting	• Reporting on environmental incidents including incursions of weed, pest and feral species and any harm to listed species.
Corrective Actions	In the event that noise-related impact is suspected, the incident will be investigated to confirm a noise-related impact has occurred and identify the most appropriate action(s) to reduce the impact. This may include one or more of the following: • Implementation of further noise reduction measures. • Restriction on vessel movements/activities.
Term	For the duration of construction activities.
Responsibility	• Piling and Construction Contractors to ensure works are conducted in compliance with this EMF. • Piling and dredging Contractors to implement noise management aboard all vessels. • Construction Contractor to implement the Construction Noise and Vibration Management Plan.

2.4.2 Underwater Noise

The following PSMF relates to managing the potential impacts resulting from underwater noise impacts during piling (Table 10) and dredging (Table 11) for the Project potentially impacting on threatened and migratory marine species.

Table 10 Protected Species Management Framework – underwater noise (piling)

Protected Species Management Framework – underwater noise (piling)	
Element	Impact of underwater noise on protected marine species.
Objectives	• Minimise the risk of disturbance to marine species from underwater noise from piling. • Establish and maintain awareness of the importance of protecting marine species.
Targets	• No avoidable disturbance to protected marine species as a result of noise generated during piling activities. • All personnel associated with piling operations to complete an HSE induction. • At all times that piling barge is operational, at least one crew member is a trained MFO and acting as lookout for protected marine species.
Key Performance Indicators	• Number of audits and incident reports. • Number of reported sightings of live, injured or dead protected marine species. • Number of personnel completing an HSE site induction. • Availability of MFO-trained crew member on operating piling barge.
Management	• Pile driving activities will only be undertaken during daylight hours. • Pile driving will commence each day with the "soft start" procedure, where pile driving impact force will be gradually scaled up over a five minute period. This is considered to provide an opportunity for any sensitive marine animals to leave the area before full hammering energy is realised. • The MFO will undertake assessments of the Observation and Piling Response Zones as follows: • On each occasion that the piling barge has been non-operational for a period exceeding 30 minutes, a visual assessment will be undertaken of the 750 m radius Observation Zone by the MFO for a period of 20 minutes. Piling will not recommence until no protected marine species have been sighted within the 500 m radius Piling Response Zone for a period of 10 minutes. • The assessment of the Observation Zone will be made from an elevated position on the piling barge, where a clear line of sight is achievable to the edge of the zone. • The MFO will not be engaged in any other activities during the 20-minute assessment period.

Protected Species Management Framework – underwater noise (piling)	
	• Every 30 minutes whilst the piling barge is operating, the MFO will dedicate a period of five minutes for scanning (from an elevated position) for protected marine species within the Start-up Exclusion Zone. • Once piling operations have commenced, if protected marine species enter within 500 m of the pile being driven (i.e. the Piling Response Zone), then piling will be temporarily suspended. This is likely a conservative basis as it is noted that a turtle would need to loiter within that immediate location for an extended period, if the suggested noise exposure criteria were to be exceeded (as weighted for hearing acuity and based upon recommendations in Southall et al. [2019]). Piling will not recommence until no protected marine species have been sighted within the 500 m radius Piling Response Zone for a period of 10 minutes. • Piling that commences prior to a period of low visibility (defined as where continuous visual observations to a distance of 1000 m from the piling barge is not possible), will continue unless, within the preceding 12 hours, there have been three or more suspensions of piling due to protected marine species encroaching within the Piling Response Zone. • Pile driving activities commenced prior to a period of low visibility attributable to rainfall may continue, noting the significant in-water noise generated by precipitation, such that this natural noise source would act to diminish the relative perceptibility of pile driving noise. The generation of underwater noise by all vessels will be reduced by ensuring that: • All equipment is maintained in good operating condition (balancing, greasing, etc.) and have proper noise control systems in place. • All noise minimisation measures such as mufflers, special enclosures and sound-insulation mounts are fitted and working. • Revolving equipment such as propellers and drive shafts are balanced to reduce vibration. • Equipment such as thrusters and auxiliary plant are switched off when not in use (i.e. not running in standby mode).
Monitoring	• Turtle observations (as per Management section above). • Watch will be maintained for the presence of stranded, injured or dead protected marine species. If observed, the NT Government Marine Wildwatch line (1800-453-941) will be contacted for retrieval, treatment or post-mortem of the animal(s).
Reporting	• Daily submission of marine fauna observations sheets from Piling Contractor to the Proponent. • Weekly summary reporting to the Proponent of number of sightings of protected marine species. • Monitoring report to the Proponent at the conclusion of piling. • Any suspected noise-related incidents will be reported by the Piling Contractor to the Proponent within 24 hours of the incident occurring. • Any corrective actions implemented in response to suspected noise-related incidents will be detailed in the weekly report to the Proponent.
Corrective Actions	In the event that noise-related impact is suspected, the incident will be investigated to confirm a noise-related impact has occurred and identify the most appropriate action(s) to reduce the potential for further impacts to occur. This may include one or more of the following: • Implementation of additional noise reduction measures (e.g. bubble curtains, if these prove effective within the prevailing tidal current conditions). • Increasing the radius of the Observation Zone to 900 m.
Term	For the duration of pile driving activities.
Responsibility	• Piling Contractor to ensure works are undertaken in compliance with this EMF.

Protected Species Management Framework – underwater noise (piling)	
	• Piling Contractor to implement turtle management and monitoring programs. • Project Manager for Piling Contractor to liaise with Proponent and DEPWS on response to stranded, injured or dead protected marine species and potential recovery, treatment or post-mortem. • Piling Contractor to implement noise management aboard all vessels.

Table 11 Protected Species Management Framework – underwater noise (dredging)

Protected Species Management Framework – underwater noise (dredging)	
Element	Impact of underwater noise from dredging on protected marine species.
Objectives	• Minimise the risk of disturbance to protected marine species from underwater noise from dredging. • Establish and maintain awareness of the importance of reducing impacts upon protected marine species
Targets	• No avoidable disturbance to protected marine species as a result of noise generated during dredging activities. • All dredging personnel to complete a Health, Safety & Environment (HSE) induction. • At all times that dredge is operational, at least one crew member is a trained MFO and acting as lookout for protected marine species.
Key Performance Indicators	• Number of audits and incident reports. • Number of reported sightings of live, injured or dead protected marine species. • Number of personnel completing an HSE site induction. • Availability of MFO-trained crew member on operating dredge.
Management	• MFO to undertake assessments of the Observation, Start-up Exclusion and Dredging Response Zones as follows. • On each occasion that the dredge has been non-operational for a period exceeding 30 minutes, a visual assessment will be undertaken of the 750 m radius Observation Zone by the MFO for a period of 20 minutes. Dredging will not recommence until no protected marine species have been sighted within the 500 m radius Start-up Exclusion Zone for a period of 10 minutes. • The assessment of the Observation Zone will be made from an elevated position on the dredge, where a clear line of sight is achievable to the edge of the zone. • The MFO will not be engaged in any other activities during the 20-minute assessment period. • Every 30 minutes whilst the dredge is operating, the MFO will dedicate a period of five minutes for scanning (from an elevated position) for protected marine species within the Start-up Exclusion Zone. • Once dredging operations have commenced, if protected marine species enter within 50 m of the dredge, or a dolphin with calf enter within 150 m of the dredge (i.e. the Dredging Response Zones), then dredging will be temporarily suspended. Dredging will not recommence until no protected marine species have been sighted within the 500 m radius Start-up Exclusion Zone for a period of 10 minutes. • Dredging that commences prior to sunset, or prior to a period of low visibility (defined as where continuous visual observations to a distance of 1000 m from the dredge are not possible), will continue unless, within the preceding 12 hours, there have been three or more suspensions of dredging due to protected marine species encroaching within the Dredging Response Zone. • The generation of underwater noise by all vessels will be reduced by ensuring that: - All equipment is maintained in good operating condition (balancing, greasing, etc.) and have proper noise control systems in place. - All noise minimisation measures such as mufflers, special enclosures and sound-insulation mounts are fitted and working.

Protected Species Management Framework – underwater noise (dredging)	
	- Revolving equipment such as propellers and drive shafts are balanced to reduce vibration. - Equipment such as thrusters and auxiliary plant are switched off when not in use (i.e. not running in standby mode).
Monitoring	• Protected marine species observations (as per Management section above). • Watch will be maintained for the presence of stranded, injured or dead protected marine species. If observed, the NT Government Marine Wildwatch line (1800-453-941) will be contacted for retrieval, treatment or post-mortem of the animal(s).
Reporting	• Daily submission of marine fauna observations sheets from Contractor to the Proponent. • Weekly summary reporting to Proponent of number of sightings of protected marine species. • Monitoring report to the Proponent at the conclusion of dredging. • Any suspected noise-related incidents will be reported by Contractor to Proponent within 24 hours of the incident occurring. • Any corrective actions implemented in response to suspected noise related incidents will be detailed in the weekly report to Proponent.
Corrective Actions	In the event that noise-related impact is suspected, the incident will be investigated to confirm a noise-related impact has occurred and identify the most appropriate action(s) to reduce the impact. This may include one or more of the following: • Implementation of further noise reduction measures. • Restriction on vessel movements/activities. • Increase in the radius of the Observation Zone to 900 m.
Term	For the duration of dredging activities.
Responsibility	• Contractor to ensure works are conducted in compliance with this PSMF. • Contractor to implement noise management aboard all vessels.

2.4.3 Physical Interaction

The following PSMF relates to managing the potential impacts resulting from physical interaction during the construction of the Project potentially impacting on threatened and migratory marine species (Table 12).

Table 12 Protected Species Management Framework – physical interaction

Protected Species Management Framework – physical interaction	
Element	Vessel interaction with protected marine species.
Objectives	• Minimise the risk of injury to, or mortality of, protected marine species. • Develop and maintain awareness of the need to protect marine species.
Targets	• No incidents of vessel interaction with protected marine species. • All dredging personnel to complete an HSE induction, including protected marine species awareness and management requirements. • All vessel masters competent in protected marine species interaction procedures. • At all times that the dredge and piling equipment is operational, at least one crew member is a trained MFO.
Key Performance Indicators	• Number of incident reports. • Number of reported sightings of live, injured or dead marine fauna. • Number of personnel completing an HSE site induction. • Availability of MFO trained crew member on operating dredge and piling equipment.
Management	• Training of Vessel Masters in interaction procedures and specified crew as MFOs. • A trained MFO must be on duty, above deck with good visibility, during all dredging and piling operations. • On each occasion that the dredge and piling equipment has been non-operational for a period exceeding 30 minutes, a visual assessment shall be undertaken of the 150 m radius Observation Zone by the MFO for a period of 10 minutes. Dredging will not recommence until no protected marine species have been sighted within the 150 m radius Observation Zone for a period of 10 minutes. • The assessment of the Observation Zone will be made from an elevated position on the dredge, where a clear line of sight is achievable to the edge of the zone. • The MFO will not be engaged in any other activities during the 10-minute assessment period. • Every 30 minutes whilst the dredge is operating, the MFO will dedicate a period of five minutes for scanning (from an elevated position) for protected marine fauna within the Exclusion Zone. • If protected marine species are sighted within the Observation or Exclusion Zone, then a response in accordance with vessel interaction procedures will be implemented. Dredging will be temporarily suspended if turtles, dugongs or dolphins enter within 50 m of the cutter head, or dolphins with calves enter within 150 m of the cutter head (i.e. the Exclusion Zone). • Dredging that commences prior to sunset, or prior to a period of low visibility, will continue unless, within the preceding 12 hours, there have been three or more suspensions of dredging due to protected species encroaching within the Exclusion Zone • When the CSD cutter head is used, it will only start when it is positioned near the seafloor, and rotation will be stopped before the cutter is raised through the water column. • Guidelines on approach distances for protected marine species will be followed. • Support vessels will adhere to Darwin Port speed restrictions. • Support vessels will not approach, circle or wait in front of wildlife for the purposes of casual viewing. • Watch will be maintained for stranded, injured or dead protected marine fauna; if observed, the NT Government Marine Wildwatch line (1800-453-941) will be contacted for retrieval, treatment or post-mortem of the fauna.

Protected Species Management Framework – physical interaction	
Monitoring	• Regular monitoring for the presence of stranded, injured or dead marine fauna. • Marine fauna observations (refer to management section).
Reporting	• Daily submission of marine fauna observations sheets by Dredging Contractor to the Proponent • Weekly summary reporting by Dredging Contractor to the Proponent of number of sightings, incidents and corrective actions. • Monitoring report to the Proponent at the conclusion of dredging. • Any vessel interaction incidents and protected species injury or mortality will be reported to the Proponent within 24 hours of the incident occurring. The Proponent and/or the Construction Contractor (as applicable) will also notify the NT EPA and DAWE.
Corrective Actions	• In the event that an incident or near miss occurs between vessels and protected marine species, the incident will be investigated and discussed to further improve awareness to reduce risk of collision. • For mobile vessels associated with the Project, a 5 knot vessel speed limit will be applied in areas where frequent sightings (an average of >1 per day in any one week) are made of protected marine species. • If protected marine species approach within the Caution Zone, vessels that are under way will proceed at a “no wash” speed.
Term	For the duration of dredging activities.
Responsibility	• Proponent to ensure Dredging Contractor’s documents are compliant with this DDSPMP. • Dredging Contractor implements protected marine species management and monitoring program. • Dredging Contractor’s Project Manager to liaise with DEPWS on response to stranded, injured or dead marine fauna and potential recovery, treatment or post-mortem.

3.0 Operational Environmental Management

The future Darwin Ship Lift Facility Operator will be required to prepare an OEMP that is consistent with this framework to ensure that all regulatory and environmental requirements, including imposed conditions and secondary approval conditions, are met. The OEMP will be developed with reference to environmental requirements specified in contractual documents, industry accepted practice and relevant guidelines and standards. The OEMP will be finalised following the detailed design stage of the Project, which may require changes to these management plans. As such, what is presented in this section broadly represents what will form the final OEMP. The OEMP will be submitted to the NTG prior to commencement of operation.

3.1 Key roles and Responsibilities

Key roles and responsibilities will be confirmed by the Operator on appointment and a Project-specific organisational chart will be developed and maintained by the Operator to ensure that adequate resources are available to meet the requirements of the OEMP.

Site management responsibilities will be defined and documented by the Operator before operations commence; these will include reporting and communication pathways between the Operator and NTG personnel.

Key roles to be identified include (but are not limited to):

- Operations Manager
- Health Safety, Environment and Quality Advisor
- supervisors
- employees and subcontractors.

3.2 Inductions and Training Requirements

Inductions and training requirements will be determined by the Operator having regard to consultation with the NTG, and will be in accordance with the Operator's policies and procedures. All relevant inductions will be completed by all personnel before they begin work on the site.

3.2.1.1 Environmental inductions

All operational personnel will be required to attend an induction session to inform them of their responsibilities under the OEMP. The induction will likely include:

- OEMP requirements
- statutory duties about notification of environmental harm
- environmental incident notification procedures which will include how an event is reported and to whom the event is reported (all incidents are to be reported, including near misses)
- emergency procedures - which will cover the procedure for an emergency and for evacuation of the site in the event of an emergency situation arising
- contingency plans - e.g. for hydrocarbon, chemical and other spills
- environmental data collection and documentation requirements
- complaints management procedures
- key environmental risks and issues
- hours of operations.

3.2.1.2 Environmental Awareness

A variety of tools will be used to further increase awareness of significant environmental and safety issues, and to communicate the relevant requirements documented in environmental and safety management plans. These may include:

- safety/risk assessments
- management meetings
- noticeboards/newsletters/electronic communications
- environmental incident investigations/reports.

It is also envisaged that these mechanisms will provide a vehicle for promoting adaptive management and encouraging the workforce to identify opportunities for continuous improvement.

3.2.1.3 Training

The Operator shall commit to providing sufficient and suitable resources and training of its employees to achieve the targets defined in the OEMP, as appropriate. All Operator personnel will have appropriate qualifications and experience for their role. A training register will be developed and maintained that identifies requirements in relation to qualifications, competencies and training requirements.

3.2.2 Incidents, Notifications and Emergencies

In the NT, the EP Act, the *Work Health and Safety (National Uniform Legislation) Act 2011* (WHS Act) and the *Waste Management and Pollution Control Act 1998* legislate obligations and duties to prevent environmental harm, environmental nuisance and contamination.

The two primary duties that apply to everyone in the NT are:

- General environmental duty – which means a person must not carry out any activity that causes or is likely to cause environmental harm, unless measures to prevent or minimise the harm have been taken.
- Duty to notify of environmental harm – to inform the administering authority and landowner and occupier when an incident has occurred that may have caused or threatens serious or material environmental harm.

All staff and contractors are required to report all environmental incidents or breaches of the approval conditions in accordance with statutory requirements and the timeframes that will be specified in the OEMP.

Operation-specific incident management procedures will be developed to detail the processes and resources required to respond and manage incidents through to resolution. Incidents shall be tracked through to close out using an incident tracking system or register. Complaints will be investigated by the operations management team and action will be taken to enable satisfactory closeout.

Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated NTG representative and to NT EPA Pollution Hotline (1800-064-567) or, for marine fauna incidents, Marine Wildwatch line (1800-453-941) within 24 hours.

When in any doubt as to the seriousness of the event, the Operator will notify the authorities, in liaison with NTG. NTG will also be notified of any notices received from authorities.

3.2.3 Environmental Documents and Records Management

The Operator will develop or implement a document management system that fulfils requirements to operate under their OEMP before the commencement of site works.

Operational records, including subcontractor records, will be maintained to provide evidence of conformity to the OEMP.

Such records include, but are not limited to:

- correspondence to/from NTG and interested parties including minute of meetings (where relevant)
- induction and other training records
- environmental procedures and plans
- inspection and monitoring documentation (including calibration)
- non-conformance and corrective action/complaints

- environmental incidents
- audits and inspections
- delivery/waste dockets.

3.2.4 Performance Management

Performance management includes activities to ensure that goals and objectives are consistently being achieved in an effective and efficient manner. A key component of the environmental management process is the development and implementation of specific measures to ensure that the environmental risks arising from operations are minimised.

3.2.4.1 Environmental Objectives

The environmental objectives for key environmental factors have been defined by the NT EPA. Wherever applicable, these objectives should be incorporated into the OEMP. Draft objectives have been included in Section 3.3. These will be confirmed by the Operator in consultation with NTG as part of development of the OEMP.

3.2.4.2 Performance Criteria

Similarly, performance criteria will be incorporated into the OEMP to assess the effectiveness or mitigation measures and allow for continuous improvement of environmental management. Draft performance criteria have also been included in Section 3.3.

Key performance indicators (KPIs) will be defined by the Operator in consultation with NTG. Where performance criteria are not met, this will form a trigger for review of the OEMP and initiate corrective actions specific to the circumstances.

3.2.5 Inspections, Monitoring, Auditing and Reporting

Inspections, monitoring, auditing and reporting will be developed and undertaken to document compliance with approval conditions, commitments and the requirements of the OEMP.

3.2.5.1 Inspections/Monitoring

Site and facilities inspections will be conducted by the Operators site supervisors to ensure compliance with the OEMP. Monitoring will also be undertaken in accordance with the OEMP and other supporting management plans (refer Sections 1.6 and 3.3).

Where required, any monitoring equipment should be maintained and calibrated in accordance with manufacturers guidelines to ensure reliability of equipment and data. Analysis should be undertaken by a NATA accredited laboratory unless otherwise stated. Monitoring data and results will be maintained in a database, with results reviewed, interpreted and reported in accordance with the developed monitoring and reporting requirements and timeframes.

If monitoring or inspections indicate that activities are not in compliance with the OEMP, necessary corrective actions will be implemented, and authorities informed in accordance with legislative requirements.

Any corrective actions resulting from inspections will be entered onto a ‘Non-conformance and Corrective Action Register’ and the progress tracked for completion.

3.2.5.2 Internal Audits

Internal audit of the OEMP will be undertaken in in the following order:

- Prior to commencement of operations to assess the likely effectiveness of the OEMP and to identify any opportunities for improvement.
- Following a period of operation (three to six months) after the commencement of operations to assess the effectiveness of the implementation of the OEMP, and of the monitoring and reporting procedures being applied. The intent of this audit will be to identify any opportunities for improvement to ensure monitoring, reporting and record keeping are sufficient to support required reporting.

- Further internal audits may be conducted as required during the operation of this facility. These audits will be used to incorporate changes, or to reaffirm the effectiveness of the OEMP.

3.2.5.3 External Audits

Where required, external audits may be organised by the Operator and conducted by an independent third party in relation to environmental matters. The Operator will assist with any external audit pursuant to contractual terms and legislated environmental obligations.

Results from any external audits will be reviewed by the Operator, with any necessary corrective actions assigned to operational personnel to ensure appropriate and timely closeout. Any corrective actions will be entered into a corrective action register and the progress tracked to completion.

3.2.5.4 Project Corrective Action Register

Any environmental non-conformance (e.g. incidents, audit-related non-conformance, complaints, government notices) will be recorded in a corrective action register or similar to be developed by the Operator. The corrective actions register will detail the non-conformance, the corrective action required, the responsible person(s), the timeframes by which the action is to be completed, and the actual completion date. Each non-conformance will be reviewed, and it will be established if there are any actions available to reduce the severity, consequence or likelihood of re-occurrence.

3.2.5.5 Reporting

Incidents that have caused or threaten to cause serious or material environmental harm will be reported directly to the NT EPA within 24 hours of identification. Incidents that are reportable to an Authority (e.g. wildlife hotline or oil spills) should also be reported to the NTG.

An Annual Environmental Report will be prepared for each year of operation, and should at a minimum include the following:

- evaluation of compliance with the OEMP
- summary of monitoring data and interpretation of results
- summary of non-compliance events
- relevant trends and interpretation against performance criteria for each environmental aspect.

3.2.6 Complaints Management

The Operator will document any complaints which are relevant to managing environmental impacts in accordance with the OEMP and where required under NT Legislation. Complaints can be lodged by stakeholders or any member of the community.

All relevant complaints will be investigated to ensure appropriate corrective actions are taken to resolve any issues as appropriate and will be recorded and summarised through an Annual Environmental Report to be prepared by the Operator (refer Section 3.2.5.5).

3.3 Proposed Factor Management Measures

Mitigation and monitoring measures have been developed for each of the preliminary key environmental factors identified in the ToR as well as other factors identified during the risk assessment, technical studies and stakeholder engagements. For each factor or aspect identified, environmental objective and performance criteria have also been defined as outlined in Table 1.

Proposed management measure that needs to be considered during operations are presented below under the following factor headings to maintain consistency with the structure of the technical chapters of the Draft EIS (Chapters 7 through 11):

- Marine Environmental Quality
- Marine Flora and Fauna
- Air Quality and Greenhouse Gases

- Terrestrial Environmental Quality
- Terrestrial Flora and Fauna
- Surface Water and Hydrological Processes
- Human Health.

3.3.1 Marine Environmental Quality

Table 13 Marine environmental quality operational management measures

Environmental objectives	***Protect the quality and productivity of water, sediment and biota so that environmental values are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • Audit score of 100% compliance on any audits of hazardous goods storage and handling requirements.
Proposed mitigation measures	
• Stormwater treatment system to be maintained. • OEMP to include mitigation to reduce build-up of contaminants on hardstand areas. • Engaging with Port of Darwin regarding the Port Environmental Protection Plan. • Preparation and implementation of a Marine Spill Response Plan in line with the existing Darwin Port Oil Spill Contingency Plan. The plan will also reference the NT (DIPL Marine) OSCP. • Compliance with AS1940-2004 (Storage and handling of flammable and combustible liquids). • Preparation and implementation of a defueling/refuelling management plan. • Spill kits to be located at suitable locations on site during construction and operation and appropriate personnel trained in use.	
Monitoring and reporting requirements	• Event triggered sediment and water quality sampling frameworks will be implemented in the event of an unplanned release of a pollutant. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated NTG representative and to NT EPA Pollution Hotline (1800-064-567) within 24 hours.

3.3.2 Marine Flora and Fauna

Table 14 Marine flora and fauna operational management measures

Environmental objectives	***Protect marine flora and fauna so that biological diversity and ecological integrity are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the Project site.
Proposed mitigation measures	
• Stormwater retention and treatment systems constructed on site to be maintained. • Incorporate spill response measures into OEMP. • Reduction of light spill into marine environment from vessels and infrastructure to as low as practically possible through the implementation of lighting in accordance with the National Light Pollution Guidelines for Wildlife (DEE, 2020). • Preparation and implementation of a Biosecurity Management Plan, including vessel risk assessment and inspection protocols. • Implementation of vessel speed limitations aligned with Darwin Port Harbourmaster requirements. • Implementation of standard navigational procedures and navigation aids. • Contractors operational management measures should incorporate waste management procedures to capture biofouling removed from vessels on the hardstand areas. • Consultation with the Aquatic Biosecurity Unit within the NT Department of Industry, Tourism and Trade to ensure consistency with existing quarantine arrangements for Darwin Harbour facilities.	
Monitoring and reporting requirements	• Vessel risk assessment and inspection protocols as per requirements of Biosecurity Management Plan. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, be reported to the designated NTG representative and to NT EPA Pollution Hotline (1800-064-567) or, for marine fauna incidents, Marine Wildwatch line (1800-453-941) within 24 hours.

3.3.3 Air Quality and Greenhouse Gases

Table 15 Air quality and greenhouse gases operational management measures

Environmental objectives	***Maintain air quality and minimise emissions and their impact so that environmental values are protected.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • No complaints from onsite staff or the community regarding air quality from operation of facility.
Proposed mitigation measures	
• Ensure containers are sufficiently covered to prevent fugitive emissions from spills and volatilisation of vapours. • Avoid the use of open vats and require vessels to be covered and payloads to protected from wind in an effort to limit fugitive emissions. • All ships berthed at the Project shall make use of the available shore power. Auxiliary engines should not be in use over prolonged time periods when ships are at berth. • Operate machinery, equipment, vehicles, dredges and support vessels efficiently to minimise exhaust emissions. *Blast and paint facility* • Design and construct blast and paint facility using accepted practice control technologies with the aim to minimise the risk of VOC and particulate matter fugitive emissions as much as practical • Install and correctly maintaining particulate and VOC control technologies, plant and equipment • Ensure temporary building extension of the blast and paint facility for larger vessels maintains the controlled environment. • The operational procedures shall detail the blast and paint facility maintained in a controlled environment to ensure air emissions are only released via the roof vents. • Air released to atmosphere via the roof exhaust stacks shall be passed through particulate, VOC and odour capturing filters (e.g. activated carbon) prior to exhaust to the atmosphere. *Abrasive blasting* • Before blasting the Operator will undertake a risk assessment to determine the likelihood of lead paint presence and confirm through testing where relevant. When removing tough hull stains, minimise the use of stain removers and consider more abrasive rubbing or polishing compounds. • Place material collected from blasting, sanding and scraping operations in disposal containers to prevent emissions to the atmosphere as soon as practical. *Painting* • Maximise efficiency of antifouling paint by selecting the most appropriate product for a particular vessel. • When spray painting is required to occur partly outdoors (e.g., to accommodate a vessel larger than the blast and paint building), fully enclose the vessel (ends, top and floor) or item being painted with temporary screening materials. Weight the edges of the screens to keep them in place. • Use efficient spray equipment (transfer efficiency >65%) such as high-volume spray guns. • Where possible use electrostatic spraying methods. These require less pressure, produce little overspray, and use relatively little paint. • Where appropriate, consider using low-VOC, high solids content and water-based paints or surface preparations instead of traditional paint and primer. • Keep spray guns and lines clean and well maintained to reduce emissions. • Prevent evaporation of solvents by using tight-fitting lids or stoppers. *Greenhouse gases* • Maintain equipment and vehicles to ensure engine efficiency and use fuel efficient equipment where able. • Minimise idling time of plant and equipment and switch engines off when not in use. • Where practicable prioritise the selection and use of electric equipment (over fuel combustion engines) • Recycle any waste produced where feasible. • Shore power during the operation phase should be procured from renewable energy suppliers where practicable. • Prioritise the selection and use of electric vehicles and equipment (over fuel combustion engines) as much as practicable. This would include mobile plant such as forklifts and light vehicles for onsite use.	

• Maintain equipment and vehicles to ensure engine efficiency and use fuel efficient equipment where able	
Monitoring and reporting requirements	Air quality impacts at sensitive receptors due to construction and operation of the Project are not predicted to be significant due to the separation distance between the Project and sensitive receptors. Sensitive receptors are well outside the recommended separation distances listed in NT EPA *Guideline: Recommended Land Use Separation Distances* (2017). Based on the result of the assessment, no air quality monitoring is deemed to be required for the construction of operation phases of the Project.

3.3.4 Terrestrial Environmental Quality

Table 16 Terrestrial environmental quality operational management measures

Environmental objectives	***Maintain the quality of land and soils so that the environmental values are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site. • Audit score of 100% compliance on any audits of hazardous goods storage and handling requirements.
Proposed mitigation measures	
• Routine maintenance for all waste management systems. • Routine maintenance of wastewater and water treatment systems with links to Biosecurity Management Plan. • Routine maintenance of stormwater management systems. • Materials will be recycled wherever possible. • Segregation of waste by type on site and collected on a regular basis by a suitably licenced contractor and disposed of at a licenced landfill. • Waste oil will be stored in an appropriate fuel storage bund prior to transportation for appropriate disposal. • Littering on site is prohibited and work and office sites are to be kept clean and tidy. • Rubbish containers are to be carried in all vehicles and provided at all work sites. • Waste management requirements will be addressed in site inductions. • Routine maintenance program will be developed for all waste management systems including wastewater management systems. • All hazardous and dangerous goods will be handled and stored according to the Australian Standards. • Minimise use of hazardous materials where possible and use alternatives where feasible. • Delivery of hazardous materials will be in line with site use to avoid the need to store significant quantities. • Contaminated runoff and contaminated soil will be collected and remediated or transported to a suitable facility for disposal.	
Monitoring and reporting requirements	• Operational procedures will detail the frequency of site inspections to be conducted. • Inspections of waste and wastewater management systems will be undertaken in accordance with manufacturer requirements and the Contractors operational procedures. • Volumes of listed waste material being stored or disposed of must be reported in accordance with NT EPA requirements. • Inappropriate waste disposal will be reportable as an incident in accordance with the Operators incident reporting processes. • Inspections of storage tanks and bulk containers and the integrity of bunded areas, pavement and associated containment systems will be conducted as per the Operators procedures. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated NTG representative and to NT EPA Pollution Hotline (1800-064-567) within 24 hours.

3.3.5 Terrestrial Flora and Fauna

Table 17 Terrestrial flora and fauna operational management measures

Environmental objectives	***Protect the NTs flora and fauna so that biological diversity and ecological integrity are maintained.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site.
Proposed mitigation measures	
• Management practices to prevent the introduction and spread of weeds and feral animal species will be included in the OEMP. This will be linked to the Biosecurity Management Plan as appropriate to prevent the introduction of weed or feral/pest species via vessels as appropriate.	
Monitoring and reporting requirements	• Periodic (at least quarterly) site inspections. • Reporting on environmental incidents including incursions of weed, pest and feral species. • Weed and pest monitoring as required in the OEMP informed by the Biosecurity Management Plan.

3.3.6 Surface Water and Hydrological Processes

Table 18 Surface water and hydrological processes operational management measures

Environmental objectives	***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.*** ***Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • 100% investigation and reporting of any environmental incident at the site.
Proposed mitigation measures	
• Ensure rainfall runoff from the washdown, blast and paint bays is captured and treated. • Operational procedures to detail the containment, and where possible treat and reuse wastewater from wash down and blast and paint bays. • Undertake ‘at source’ mechanical clean-up of solid waste material to minimise entry to the wastewater system. • Operate and maintain wastewater treatment system and stormwater drainage system and stormwater treatment devices as intended. • Operational procedures to detail the frequency of wastewater and stormwater system inspections to identify any failures and, if necessary, undertake repairs. • Ensure treated wastewater in excess of what can be re-used will be disposed of appropriately. • Implement spill and leak prevention and control techniques for land-based activities. • Ensure appropriate spill kits are available and provide training on kit use. • Any spillage of wastes, contaminants or other materials shall be cleaned up as quickly as practicable using procedures that prevent contaminants or material being transferred to the stormwater drainage system. • Install bunded areas and drainage lines separate from the stormwater drainage in chemical storage and handling areas to reduce the likelihood of chemical contamination of stormwater. • Delivery of hazardous materials will be in line with site use to avoid the need to store significant quantities.	

Monitoring and reporting requirements	• Operational procedures to identify the frequency of stormwater system and drain inspections. • Operational procedures to outline the monitoring and management of surface water from within the hardstand area and material handling areas to meet appropriate water quality criteria before it is allowed to discharge to the marine environment. • Any incidents that have caused environmental harm, or that have the potential to cause environmental harm, will also be reported to the designated NTG representative and to NT EPA Pollution Hotline (1800-064-567) within 24 hours.

3.3.7 Human health

Table 19 Human health operational management measures

Environmental objectives	***Ensure that risks to human health are identified, understood and adequately avoided and/or mitigated.***
Performance criteria	• No activity in breach of the provisions of any environmental legislation and Project environmental approval conditions. • No noticeable increase in biting insect populations and no Project related complaints from biting insects. • No observed ponding/breeding sites within the Project footprint.
Proposed mitigation measures	
• Implement a Biting Insect Management Plan in accordance with NT Department of Health Guidelines and the WHS Act. • Ensure Biosecurity Management Plan includes requirements in relation to mosquitoes and international health regulations.	
Monitoring and reporting requirements	• Site inspections to identify potential breeding sites. • Any significant mosquito activity will also be reported to NTG and/or the Medical Entomology Branch and monitored if risks to human health are identified.

4.0 Conclusion

This framework defines the parameters for the preparation of subsequent CEMPs and OEMPs to ensure that potential impacts and risks associated with the delivery of the Project are appropriately managed and monitored. The environmental management framework identifies and describes the relevant management plans that are required for the Projects construction and operation to enable the Proponent to fulfil its environmental and social commitments and obligations.

CEMPs and OEMPs will be developed in advance of relevant Project works. As the Project progresses, objectives, performance criteria and mitigation measures presented in this EMF will be refined in consultation with the successful contractors, to ensure that an adaptive approach is taken to management of the potential environmental impacts of the Project.

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