Executive Summary

Executive Summary

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 (Figure 1). The early design and procurement of the Project has been managed by a dedicated NTG Ship Lift Project Team within the Department of the Chief Minister and Cabinet (DCMC). Final procurement and construction will be managed by the Department of Infrastructure, Planning and Logistics (DIPL).

The location of the Project at East Arm is consistent with long-term master planning for Darwin. The NTG has been developing land at East Arm for marine industries since 2004 and in 2014, proposed to include a ship lift as part of the development of its East Arm Marine Industry Park. The NTG's vision is for the Project to be enabling economic infrastructure that will grow the maritime sector and enhance Darwin's competitive advantage as a marine repair, maintenance and sustainment centre for Northern Australia. Government and business stakeholders suggest the facility will be foundational infrastructure for a marine services precinct, consolidating a range of marine services on the East Arm Peninsula.

The Project will enable maintenance and servicing of a broad range of industries including the Australian Defence Force (ADF) and Australian Border Force (ABF) vessels and for commercial and private vessels (oil, gas, pearling, fishing and other marine industries). The Project will support the continued economic growth of Darwin as a logistics and marine services hub of the Northern Territory (NT), and Northern Australia.

Assessment Process

A notice of intent (NOI) for the Project was submitted to the Northern Territory Environment Protection Authority (NT EPA) in April 2018 by Northern Ship Support Pty Ltd. In November 2018 the NT EPA determined that further assessment was required in the form of an Environmental Impact Statement. Concurrently further studies were undertaken that identified where enhanced functionality and changes to design for supporting marine facilities would provide benefit to the overall Project. This process led to a number of updates to the development concept. In 2019 the NTG advised the NT EPA of the updates to the Project concept which included the NTG becoming the proponent for the Project.

The NT EPA considered the material provided and issued the Draft Terms of Reference (DToR) in September 2019. The NT EPA determined that the Project has the potential to have significant environmental impacts on the following key environmental factors (NT EPA 2018a):

- marine environmental quality
- marine flora and fauna
- air quality and greenhouse gases
- social, economic and cultural surroundings.

The DToR were made available for the public consultation period. On completion of the public consultation period, the final ToR for the Project were issued by the NT EPA in December 2019.

AECOM was engaged to prepare this Draft EIS to address the ToR. The Draft EIS will be subject to public review period of 6 weeks. During this time, the Proposal will undergo further review by regulators and the community.

An *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral for the original project was submitted by Northern Ship Support Pty Ltd in 2018 to the Commonwealth Department of the Environment and Energy (DoEE). On 25 September 2018, DoEE determined the Project to be not a controlled action (Reference No. 2018/8195).

As the Project has undergone material changes since the original referral, the NTG is submitting a new referral for the Project. The referral was lodged concurrently to this EIS and will likely to be available for public comment in November 2021 on the EPBC referrals website.

PROJECT ID 60633505
CREATED BY PK
APPROVED BY JC
LAST MODIFIED 04 OCT 2021

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LEGEND
- Project footprint
- Project dredging footprint

Project location

NORTHERN TERRITORY GOVERNMENT OF AUSTRALIA
DARWIN SHIP LIFT PROJECT

Figure
1

A4 size

Project Description

The Project will be Northern Australia's largest common user ship lift. The infrastructure layout is shown in Figure 2 and will include:

- ship lift of approximately 26 metres (m) width and 103 m length, capable of lifting vessels weighing up to 5,500 tonnes (t) plus associated platform, trestles and vessel transfer system
- self-propelled modular transporter (SPMT) vessel transfer system
- approximately 13 hectares (ha) of hardstand area for ship repair and maintenance
- vessel wash area with separate contained drainage and treatment system
- stormwater system to capture and treat runoff water before discharge
- enclosed blast and paint facility with separate contained drainage system and a negative pressure and air filtration system
- site services and utilities
- security infrastructure
- ancillary facilities including:
    - administration building
    - ship lift control room
    - SPMT garage.
- access channel and dredged manoeuvring areas
- six wet berths
- heavy lift platforms suitable for a 100 t crane at each berth
- revetments and quay structures.

Once constructed, the Project will comprise:

- an NTG owned facility that will lease areas/berths on a common user basis under a principal operator (Darwin Ship Lift Facility), and
- a privately owned berthing and maintenance facility.

The infrastructure delivered by the Project will fill an existing industry gap and is anticipated to facilitate further development of the region's marine services and logistics, thereby supporting jobs and economic growth of the NT.

Project construction is expected to be completed in 24-36 months following completion of approvals and detailed design by the end of 2022, with the Project planned to be operational by 2025.

The Project is assumed to create 100 direct jobs per annum during the two to three-year construction phase, although the actual number will be determined by the design and delivery methods chosen by the contracted builder. It is expected that a large portion of the work will be completed within the NT.

The NT Government estimates that jobs generated and supported by infrastructure delivered by the Project will range from 78 to 146 full-time equivalents (FTE) a year in Year 3 (start-up) and between 187 and 359 additional FTE a year by Year 20. These estimates do not consider further job creation for contractors working on vessels within the facility. The employment benefits are expected to grow incrementally as the East Arm marine precinct grows however, it may take up to a decade to gain the full market share and for the estimated economic, employment and social benefits to be delivered.

The Project is currently at a concept design level and will continue to undergo design refinement. These changes are not anticipated to extend beyond the disturbance areas defined in Figure 2 or to change the significance of environmental impacts presented in this document.

PROJECT ID 60633505
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APPROVED BY JC
LAST MODIFIED 02 NOV 2021

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Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND
- Project footprint
- Darwin Ship Lift Facility
- Privately-owned Facility
- Potential disturbance area
- Revetments
- Berths and manoeuvring basin
- Multi-user Barge Ramp Facility (MUBRF) channel

Note:
The layout is indicative only

Proposed infrastrucure layout

NORTHERN TERRITORY GOVERNMENT OF AUSTRALIA
DARWIN SHIP LIFT PROJECT

Figure
2

A4 size

Alternatives

Initially, the Marine Industry Park to the northeast of the current site was earmarked for the location of the Project. When expressions of interest were sought in 2015-16 several respondents proposed alternative locations, including the current site.

The current site was selected for several reasons and has the following environmental benefits:

- naturally deeper water access close to the site providing the opportunity to use of the existing Multi-user Barge Ramp Facility (MUBRF) channel and thereby minimising additional channel dredging requirements and facilitating all-tide access for ADF and ABF vessels. This also minimises alterations to existing Darwin Harbour navigational procedures
- brownfield disturbed site that limits mangrove loss to an isolated 1.0 ha patch
- existing knowledge of the landside and marine areas due to previous heritage and environmental studies undertaken for the nearby Marine Supply Base (MSB) and MUBRF developments
- direct access off Berrimah Road, which is designed for heavy vehicle traffic accessing East Arm Wharf (EAW)
- low expected volume and frequency of maintenance dredging.

Several site-specific design alternatives were also considered including alternative Project footprints, ship lift size, dredging volumes and alternate fill material sources and ship lift systems.

The Project is currently at a concept design level and will continue to undergo design refinement. The NTG is undertaking a staged procurement process for the Project and is currently at Request for Proposal stage to support the design development and construction planning. The final procurement stage will include potential construction contractors providing detailed design. Following this, a design and construction contractor will be engaged. Potential construction contractors are encouraged to consider alternatives that promote innovation, flexibility and efficiency.

Stakeholder Consultation

The NTG has consulted with key stakeholders while completing the Project feasibility studies over the past five years. This has included consultation with industry, government departments and regulators, as well as providing public updates of the Project through media releases and via NTG website updates.

Further to this a communication and engagement strategy was prepared in 2020 to support formal regulatory approvals, including consultation to support the EIS and Development Consent Process being advanced at that time. The overall objectives of this strategy are to:

- provide objective and appropriate communication on the project to key stakeholders, so they can give informed feedback
- identify and map stakeholders and issues to ensure the consultation strategy is tailored to the needs and interests of relevant stakeholder groups
- provide timely reports on issues raised during consultation to guide good decision-making.

Engagement has included the preparation and distribution of fact sheets, briefings and interviews of targeted stakeholders, including Territory and Commonwealth Government, Larrakia organisations, environment groups, industry groups and amateur fishermen.

Consultation with these stakeholders has informed the social impact assessment, a consultation report and the Social Impact Management Plan (SIMP) which outlines measures to enhance the benefits and reduce potential negative impacts of the Project.

The NTG will continue to consult during the public review period by:

- incorporating stakeholder comments from the public review period of this EIS
- maintaining the Project website (https://cmc.nt.gov.au/advancing-industry/ship-lift) to keep the community up-to-date on progress of the Project

- providing information to stakeholders when requested, including providing responses directly to the stakeholders who asked questions during earlier consultations.

Environmental Setting

The Project is located on the East Arm Peninsula within the Darwin Harbour. The existing land portion of the Project is fully fenced and is used for the provision of marine services activities by a private company. It currently accommodates a car park, site office, marine equipment, material hardstand/laydown area, a works depot, marine workshop and a boat ramp. The boat ramp was constructed in World War II and used in more recent times for recreational boating purposes, prior to the construction of the current East Arm Boat Ramp at Casey Street.

Major developments on the shoreline within Darwin Harbour include INPEX LNG and Santos Darwin LNG plants located on Middle Arm, PWC's Channel Island power station, adjacent to Middle Arm, EAW located on East Arm Peninsula, Darwin CBD, the Waterfront Precinct on the eastern side of the main body of the Harbour, and suburban developments on the Harbour shoreline from Darwin in the north to Palmerston in the east. A small residential area also exists at Wagait Beach, near Mandorah, on the western side of the mouth of the Harbour.

Darwin Harbour contains a wide diversity of habitats, and associated flora and fauna communities, some of which may be important to the continued viability of populations of protected marine fauna within the region. However, East Arm (including the Project area) is not known to contain any habitats that are of critical importance to the survival of protected marine species.

The East Arm Peninsula played a crucial role during World War II when it became a refuelling base and defence headquarters. Defence infrastructure included the strategically significant Catalina Flying Boat Base (FBB), occupied by the Royal Australian Air Force during the war. About 200 metres east of the Project site is the former Lugger Maintenance Section (LMS), which supported Z Special Unit's operations in South-East Asia during the war.

Most of the FBB has been demolished to make way for industrial development. The surviving features as of 2015 were the Catalina ramp, crash boat slip way, a mooring pile and some fragments of a fuel pipeline. In 2015, the Minister for the Environment decided not to grant the FBB heritage status under the NT *Heritage Act 2011*. The Project construction phase will extend over the remaining FBB area. It is proposed that interpretative signage close to the Project be installed in a public place to indicate that the area was once the location of FBB and the LMS and its significance during World War II.

The Project is also close to two registered Sacred Sites protected under the NT Aboriginal Sacred Sites Act 1989. These sites, Catalina Island and Old Man Rock, are on the Aboriginal Areas Protection Authority (AAPA) register of sacred sites. A current AAPA certificate has been obtained for the Project which outlines management requirements in relation to these sites. No Aboriginal heritage sites are located within the Project footprint.

Assessment Methodology

Each of the four environmental factors that the NT EPA identified as having the potential to be significantly impacted by the Project have been assessed in terms of: relevant policy and guidelines, existing values, potential impacts, and proposed mitigation and monitoring measures. They include:

- marine environmental quality
- marine flora and fauna
- air quality and greenhouse gases
- social economic and cultural surroundings.

A risk-based assessment framework methodology was used which included an initial risk identification, a risk assessment workshop, and risk review and refinement following technical studies and stakeholder consultation. This assessment identified the need to consider further environmental factors additional to the ToR.

Risks have been assessed both pre and post-mitigation to identify residual impacts that may persist following the implementation of proposed mitigation and management measures.

Technical study methodologies to inform the EIS and risk assessment comprised a mix of desktop reviews, fieldwork (site visits/surveys, sample collection and subsequent laboratory analysis and assessment), remote sensing, modelling and consultation. A summary of the technical studies that support the EIS is included in Table 1.

Table 1 Technical studies that support the EIS

NT EPA Factor	Technical Studies
Marine environmental quality	• Marine water quality sampling events • Marine sediment sampling and modelling • Benthic habitat modelling and ground truthing • Turbidity assessment using remote sensing
Marine ecology	• Site visit to document extent of existing mangrove community • Underwater noise modelling
Air quality and greenhouse gases	• Air emissions modelling • Emission estimation and calculations
Social, cultural and economics	• Social impact assessment • Cultural heritage assessment • Noise impact assessment • Traffic impact assessment
Terrestrial environmental quality	• Preliminary site investigation (PSI) and soil sampling
Terrestrial flora and fauna	• Site visit to document existing native and introduced vegetation species

Marine Environmental Quality

The marine environmental quality assessment considers the risks and potential impacts of the Project development to marine water and sediment quality in Darwin Harbour. Marine water and sediment are not considered as end receptors, but vectors by which secondary impacts may occur to sensitive receptors such as marine flora and fauna.

The water quality in East Arm where the Project is located is generally very high and typically meets the water quality objectives set out in the Darwin Harbour Water Quality Protection Plan. Similarly, sediment quality is typically very good; the sediment geochemical assessment undertaken for the Project detected only low levels of some toxicants in unconsolidated sediments in the vicinity of the Project location. These were typically well below the Australian and New Zealand Fresh and Marine Water Quality Guidelines.

From a marine environmental quality perspective, the potential impacts to water quality are the primary concern during the Project construction phase, specifically elevated suspended sediment concentrations associated with dredging and placement of dredged material on shore as fill for land reclamation. Sediment transport modelling was undertaken to predict the potential extent and concentration of turbid plumes generated by dredging activities. This modelling suggested that the zones of impact and influence were restricted to the Project footprint for most of the time and unlikely to extend to the nearest sensitive hard coral and filter feeder communities at South Shell Island.

The potential for water quality impacts during operations will largely be reduced by in-built design mitigations such as containment and treatment of all stormwater and wastewater on site before disposal via licensed discharges onshore, or into Darwin Harbour under applicable licenses and limits.

Specific mitigation and management measures during construction and operations will be incorporated into construction environmental management plans (CEMPs), a Dredging and Dredge Spoil Placement Management Plan, and operational environmental management plans (OEMPs) to be approved prior to commencement of construction or operations. It is considered that the proposed mitigation and management measures are sufficient to reduce impacts to marine water and sediment quality during construction and operational phases of the Project so as to maintain the beneficial uses and water quality objectives for Darwin Harbour.

Marine Flora and Fauna

The marine flora and fauna assessment considers the risks and potential impacts of the Project development to marine flora and fauna habitats and species in Darwin Harbour. The marine communities that will be affected during Project construction are widely distributed within East Arm and the broader Darwin Harbour. These comprise:

- Benthic communities in intertidal and shallow subtidal 'soft sediment' habitats within, and adjacent to, the dredging and reclamation footprints. The value of these communities to the overall ecosystem function of Darwin Harbour is recognised. However, it is considered that the areas of these communities that will be disturbed are of insufficient magnitude for Project construction and operation to represent a risk of significant adverse effects upon the ecosystem function of Darwin Harbour.
- An isolated stand of remnant mangrove community of ~1.0 ha extent will be removed during reclamation works. The value of mangroves to ecosystem function is recognised, though the area of loss is considered to be sufficiently small that there is negligible risk of detectable impacts upon the East Arm or Darwin Harbour ecosystems.

While Project construction also has the potential to impact upon other marine flora and fauna communities, such as those comprised of filter feeders (e.g. sponges, soft corals), hard corals and macroalgae, it is predicted from modelling that these communities are not at risk of significant impacts.

The potential for non-native marine pest species to be introduced to Darwin Harbour is considered to pose a substantial risk of impacts to the marine flora and fauna of the harbour. These would have the potential to disturb the harbour ecosystem through their predating upon, or outcompeting of, native species, with associated food web effects. However, robust vessel risk assessment and inspection protocols have been demonstrated to be an effective means of mitigating the risk of such introductions. Such protocols were implemented for the substantial INPEX Ichthys construction program that engaged a considerably greater number of vessels than will be involved with construction and operation of the Project. In addition, there is a routine monitoring program for marine pest species within Darwin Harbour that will have the capacity to detect the introduction of these species, should it occur.

Underwater noise and vibration were identified as potential impacts during construction. Modelling indicated that the predicted area in which adverse noise and vibration levels may potentially occur does not extend across the full width of East Arm; hence, it is predicted that there is minimal potential for disruption of passage of any species between Elizabeth River and the main harbour.

Incremental increase in vessel traffic associated with the construction and operation of the Project will not be of a sufficient magnitude to represent a significantly greater risk of impacts upon benthic communities, or individuals and populations of marine fauna from vessel strike or grounding. However, mitigation measures will include surveillance protocols and controls on vessel speeds within the vicinity of the Project area. It is noted that surveillance protocols are already routinely implemented by vessels traversing the harbour, to mitigate the risk of collision with floating objects.

The potential for impacts upon marine flora and fauna via contaminant release and light spill during operations will be reduced through Project design mitigations including the containment and treatment of stormwater and wastewater on site before disposal via licensed discharges onshore, or into Darwin Harbour.

Overall, it is concluded that, with the implementation of appropriate Project design, monitoring, management and mitigation measures, the marine flora and fauna of Darwin Harbour will be protected to the extent that biological diversity and ecological integrity will be maintained. As such the impacts to marine flora and fauna are expected to be limited to areas within close proximity of the Project site.

Air Quality and Greenhouse Gases

The air quality and greenhouse gas assessment consider the risks and potential impacts of the Project development to sensitive receptors surrounding the Project area. The air quality assessment was undertaken by means of air dispersion modelling in accordance with the ToR and appropriate guidelines.

A baseline assessment was conducted to identify existing meteorology, air quality conditions as well as the location of surrounding sensitive receptors. Background concentrations for pollutant species of concern were adopted for the assessment considering available monitoring data from NT EPA air quality monitoring stations, or comparable stations where suitable local data was unavailable.

Pollutants of concern assessed in the air quality impact assessment were combustion emissions such as particulate matter. Based on the results of the dispersion modelling, there were no exceedances of the identified goals for construction or operation for any air pollutant across all averaging periods, and no significant impacts were predicted for any pollutant at sensitive receptors.

GHG emission sources were identified for both the construction and operation phases using NGER guidance and reference material. A comparison to the NT and Australian benchmark for reported emissions from 2019 data estimated a less than 1% contribution to total NGER reported emissions across all sectors within the NT.

Mitigation measures have been recommended for potential air quality impacts and greenhouse gas emissions attributed to both the construction and operational phases of the Project. Provided the mitigation strategies to further reduce pollutant emissions and GHG emissions are implemented, air quality and GHG impacts from construction and operation of the Project are consistent with surrounding industrial land use and are not expected to cause significant impact.

Social, Economic and Cultural Surroundings

A SIA was prepared in 2021 to predict and assess the social, economic, and cultural impacts of the Project. An initial scoping exercise indicated that a low-scale SIA was warranted. the SIA then assessed potentially positive and negative impacts after screening out those rated as likely to be negligible or imperceptible.

The SIA identified significant economic opportunities arising from the Project that will contribute to developing Darwin's capacity as a maritime service and supply hub, and transport and logistics precinct on East Arm. The Project is well positioned to contribute to the development of the NT economy, capacity of local businesses and industry, and a marine labour force. Key potential benefits of the Project include:

- strengthening and diversifying the economy from enabling economic infrastructure and capacity-building
- local businesses benefitting from winning work and enhanced capabilities
- enhanced employment and training opportunities for local people
- Aboriginal jobs and training opportunities resulting from the Project.

Potential negative impacts identified by the SIA included:

- Cumulative impacts of development on the values of Darwin Harbour: However, it is considered that given the scale of this Project, it's contribution to these cumulative impacts has been assessed as minimal.
- Damage to Aboriginal and European heritage, including World War II heritage: There are no Aboriginal heritage sites within the Project footprint. Potential indirect impacts to nearby Aboriginal sacred sites and World War II Catalina sites resulting from minor ocean current changes will be monitored before and after construction. A suggested mitigation strategy is interpretive signage to explain the history of World War II activity at East Arm Peninsula.
- Reduced amenity and impacts on recreational values and activities: While permanent, the scale of change is relatively small and in line with existing industrial activities. The site is designated Zone DV (Development) under the Northern Territory Planning Scheme 2020. The purpose of this zoning is to facilitate the development of major strategic industries that are important to the future economic development of the NT, including gas, road, rail, or port-related industries.
- Crowding out of other economic activities on the harbour, such as tourism and recreational fishing: While the Project is predicted to have negligible to no impact on recreational and tourism

businesses, this will be monitored during construction. The NTG will also continue to communicate with harbour tourism and recreational fishing organisations.

- Frustration by businesses who fail to win tenders or have unrealistic expectations of opportunities and detrimental impacts on competing maritime businesses: In response the NTG is committed to working with the Industry Capability Network, Maritime Industry Development Plan and Chamber of Commerce Marine Industry Council to develop a blueprint or master plan for development of the maritime sector that identifies opportunities, capacity and workforce gaps. It is noted that the facility includes the construction of a Common-user Facility (CUF) to enable growth of the marine repair and maintenance industry.
- Noise and vibration: Noise and vibration modelling indicates that impacts may be potentially audible in residential suburbs located approximately 6 km from the Project, but only in the short-term. Modelling found that construction and operational noise levels will comply with assigned noise levels under the *Northern Territory Noise Guidelines* at all noise sensitive receptors located in residential and commercial areas. Similar construction, dredging and piling occurred for the EAW Expansion and MSB, with no record of complaints or community sensitivity to these impacts.
- Heavy vehicle traffic during the construction phase of the Project. The SIA identified potential community concern about traffic safety. A Traffic Impact Assessment undertaken to assess this risk found that the additional trip generation created by the proposed construction schedule is not predicted to have a significant impact on the road network or a material decrease in road safety. Marine traffic activities for construction of the Project will be localised and relatively short-term.

Other Environmental Factors

Other environmental factors considered in response to Project risk assessments, findings of technical studies and stakeholder consultation included:

- terrestrial environmental quality
- terrestrial flora and fauna
- inland waters and hydrological processes
- human health.

Terrestrial environmental quality

A Preliminary Site Investigation (PSI) was conducted to assess the potential for contamination from historic uses of the site. The PSI indicated that it is unlikely that significant contamination of soil or groundwater had occurred at the site, limiting the risk that proposed earthworks will disturb contaminated material.

The PSI also found that the site is located within a high-risk acid sulfate soils (ASS) area and is likely to require consideration of managing potential ASS risks. However, analysis of materials to be dredged indicated that the acid neutralising capacity was well within the adopted criterion.

Notwithstanding these findings, proposed management measures also include the development of an unexpected finds protocol for contaminated soils and ASS.

Terrestrial flora and fauna

The initial EIS risk assessment identified the potential for the proposed Project to impact on biological diversity and ecological integrity through the introduction and spread of pest and weed species via the movement of vehicles and vessels to and from the Project area. It also identified the potential for piling activities to increase terrestrial noise and result in the disturbance to migratory birds that are known to roost at the EAW Dredge Spoil Pond D which is a preferred migratory bird habitat area at East Arm Peninsula.

Noise and lighting impacts associated with the construction and operation of the facility are considered unlikely to impact the migratory bird species utilising the pond as this habitat is already within an operational industrial port area and is also separated from the Project area.

Management measures to mitigate noise and lighting impacts of the Project will include a Construction Noise and Vibration Management Plan. While weeds and pests will be managed via CEMPs and OEMPs with links to the site Biosecurity Management Plan as required.

Inland waters and hydrological processes

The Project has the potential to impact on surface water and groundwater quality through the mobilisation of sediments and contaminants during rainfall and storm events. The primary sources of potential stormwater pollutants during the construction phase will be disturbed soils, storage of hydrocarbons and hazardous substances, and vehicle usage on site. During the operational phase, potential contaminants in stormwater will vary depending on the type of business' occupying the site, associated activities undertaken, and products stored.

During construction a CEMP containing an Erosion and Sediment Control Plan will be used to capture suspended sediments before they reach the Harbour. During operation the overall management of stormwater and potential contaminants mobilised in runoff and wash down waters will be a requirement of the design process. Impacts during operations will largely be reduced by in-built design mitigations such as containment and treatment of all stormwater and wastewater on site before disposal via licensed discharges and appropriate sizing of stormwater drainage infrastructure. Mitigation and management measures contained in CEMP's and OEMP's will further reduce risk of Project related impacts on hydrological processes.

Human health

Potential creation of new biting insect breeding sites was identified as a potential Project related risk during the risk assessment and stakeholder consultations. It is also noted that mosquito breeding sites pose a risk to passengers at the nearby rail terminal, and potential quarantine issues, in regard to, international health regulations. The impacts to human health from biting insects will be managed through the development of a Biting Insects Management Plan during Project construction and operation.

Historic assessments of the potential for unexploded ordinance (UXO), which included removal of UXO from the Project site as part of construction of the nearby MUBRF facility, reduce the risk of finding additional UXO. However, as these findings do not completely preclude this risk UXO risk assessment will be undertaken by construction contractors prior to the commencement of construction works.

Cumulative Impacts

Cumulative impact assessments were undertaken for each of the key preliminary factors identified in the ToR in the context of existing environmental values and reasonably foreseeable future developments.

Marine environmental quality

Assessment of impacts on marine environmental quality indicated that, if dredging is to occur concurrently with other dredging operations there is the potential for cumulative environmental impacts on water quality. It is noted that all dredging programs undertaken in the Darwin Harbour require Developmental Consent and an approved Dredging and Dredge Spoil Placement Management Plan and hence the impacts and proposed measures to manage and mitigate these potential cumulative impacts can be further considered and coordinated by regulators. As part of the approval processes stakeholders will also be given an opportunity to comment on proposed dredging programs.

In response to the NT EPA's concern regarding cumulative impacts of dredging within Darwin Harbour, and the fact that there are several developments planned in the near future, the NTG have commenced the development of a Darwin Harbour Dredging Strategy that aims to provide a framework for sustainable, leading practice management of dredging in Darwin Harbour. The Dredging Strategy will be undertaken concurrently with the assessment of this EIS, and whilst it may not be finalised prior to the finalisation of the EIS assessment process, it is anticipated to be complete prior to any dredging for the Project. The Project intends to undertake any dredging in line with the Darwin Harbour Dredging Strategy.

Marine flora and fauna

Assessment of impacts on marine flora and fauna during construction indicated that impacts are predominantly associated with cumulative habitat loss such as the loss of mangrove and soft sediment habitat and their associated biological communities. There is also potential for cumulative impacts of underwater noise and vibration associated with dredging and piling. These potential cumulative impacts were considered minor, or not to be significantly greater than the risk of impact from each Project when considered in isolation.

Air quality and greenhouse gas

The air quality assessment considered background air quality in addition to Project related air emissions for assessment against air quality goals. The potential for air quality impacts are considered to be low when assessed alongside the emissions from other known developments as there is sufficient land separation between the majority of projects considered in the cumulative impact assessment and the Project area.

Social, economic and cultural heritage

The SIA found significant cumulative economic opportunities arising from the Project that are likely to contribute to developing Darwin's capacity as a maritime service and supply hub, and as a transport and logistics precinct on East Arm. The Project is well positioned to contribute to economic growth, enhanced capacity of the NT's maritime sector and workforce development.

The SIA also found that the potential cumulative additive and interactive impacts of development in Darwin Harbour was of concern to some stakeholders. Whilst the EIS found the contribution of the Project to cumulative impacts on values of the harbour to be minimal, consideration of potential overlap with known maintenance dredging for other projects has been proposed. To further support the sustainable management of cumulative impacts within Darwin Harbour. all relevant Project impact assessments will be made available to other projects such as the Middle Arm Strategic Environmental Assessment for cumulative impact consideration.

Environmental Management

The EIS includes an environmental management framework for the delivery of the Project. This framework defines the parameters for the preparation of subsequent CEMPs and OEMPs by the Construction Contractor and site operator to ensure that potential impacts and risks associated with the delivery of the Project are appropriately managed and monitored and fulfils environmental and social commitments and obligations. Environmental requirements will be explicitly specified in contract documents.

The environmental management framework is structured around the NT EPA objectives for the key environmental factors, and includes:

- 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. The environmental management framework identifies and describes the relevant management plans that are required for the Projects construction and operation. These documents include:

- Heritage Management Plan (developed as part of this EIS)
- Noise and Vibration Management Plan
- Traffic Management Plan
- Dredging and Dredge Spoil Placement Management Plan
- Erosion and Sediment Control Plan
- Marine Spill Response Plan
- Biosecurity Management Plan.

Environmental management requirements for the privately-owned facility are outside the scope of this EIS and will be regulated under separate approval processes. However, as the operational activities are likely to be broadly similar to the Project, the environmental management framework could form the basis of developing site-specific management measures across the broader operations.

A SIMP was also developed as part of this EIS. The SIMP summarises the social and economic risks and opportunities of the Project and sets out strategies to enhance the positive and mitigate or manage potentially negative impacts.

Conclusion

This EIS has considered the potential environmental impacts of the Project consistent with the requirements of the Project ToR. Relevant technical studies have been completed to assess impacts on key environmental factors and applying a risk-based approach to developing and evaluating effective mitigation and management measures. Assessment of residual risks found a low risk of impacts upon most environmental factors following the implementation of appropriate mitigation and management measures.

The risk assessment identified one high residual risk to marine flora and fauna within Darwin Harbour associated with introduction of marine pests. The extreme consequence of the introduction of marine pest species, highlights the need to effectively implement stringent vessel risk assessment and inspection procedures. Fortunately, these are readily available, are routinely applied Australia-wide and have been demonstrated to be effective in Darwin Harbour during the INPEX Ichthys dredging campaign. In addition, there is a routine monitoring program for marine pest species within Darwin Harbour that will have the capacity to detect the introduction of these species, should it occur.

It is predicted that there is minimal potential for disruption of passage of any species between Elizabeth River and the main harbour. Incremental increase in vessel traffic associated with the construction and operation of the Project will not be of a sufficient magnitude to represent a significantly greater risk of impacts upon benthic communities, or individuals and populations of marine fauna.

Consultation found that the loss of World War II historical remnants was a concern to one stakeholder, despite their lack of formal heritage status. It is suggested that these areas be acknowledged with interpretative signage installed in nearby public areas.

The social impact assessment identified significant economic opportunities arising from the Project that will contribute to developing Darwin's capacity as a maritime service and supply hub, and transport and logistics precinct on East Arm. The Project is well positioned to contribute to the economic development of the NT, and likely to enhance capacity of local businesses and industry, and the growth of a skilled marine workforce. Several potential adverse impacts were also identified through the SIA, and these will require considered management and ongoing monitoring during the planning and construction phase of the Project.

Secondary approvals and permits under NT legislation will also be required for the construction and operation of the Project following completion of the EIS process. Approval conditions and legislative requirements associated with these secondary approvals and permits will be incorporated into subsequent environmental management plan revisions. Final dredging programs will be subject to Developmental Consent and approval of a Dredging and Dredge Spoil Placement Management Plan. As such the impacts and proposed measures to manage and mitigate resulting impacts can be considered further by regulators once the detailed design has been completed. Stakeholders will also be provided further opportunity to comment on these programs as part secondary approval processes.

NTG commits to an ongoing engagement and communication strategy during the development of the Project and broader marine industry precinct. Project information will continue to be posted on the Project website (https://cmc.nt.gov.au/advancing-industry/ship-lift).