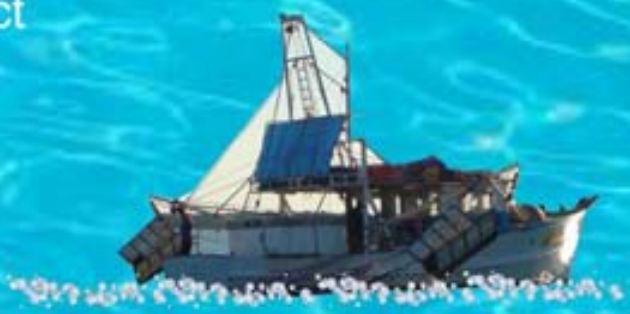
PORT of TOWNSVILLE

North Queensland

Section 8
Environmental management plan

Townsville Marine Precinct Project

Environmental Impact Statement



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8. Environmental management plan

8.1 Introduction

The following draft Environmental Management Plan (EMP) details the measures to be adopted to address identified impacts during the construction and operation phases of the Project. The EMP comprises of a number of elements, each with an overall associated management policy, mechanisms of policy implementation, proposed monitoring programs and potential corrective actions as described in Table 8-1.

Table 8-1 Structure of Environmental Management Plan

EMP Element Component	Description of Content
Element	The environmental aspect of construction or operation requiring management consideration.
Policy	The guiding operational policy that applies to the element.
Policy Implementation	The mechanisms and actions through which the policy will be achieved.
Performance Requirements	The criteria by which the success of the implementation of the policy will be determined.
Monitoring and Reporting	The process of measuring actual performance, or how well the policy has been achieved, including the format, timing and responsibility for reporting and auditing of the monitoring results.
Corrective Action	The action to be implemented and by whom in the case where a performance requirement is not met.

The Construction Contractor is responsible for preparation of a detailed construction phase EMP (EMP (Construction)), which must address the requirements set out in this draft EMP. The EMP (Construction) will take into consideration the specific construction methods proposed, including capital dredging, and tailor appropriate mechanisms, monitoring and reporting requirements to these methods.

For the purposes of this EMP, construction is taken to include all land and marine based construction activity, including dredging.

Operational phase environmental management will be addressed by the Principal as part of the Port's Environmental Management System (EMS). Operational requirements set out in this draft EMP will be incorporated into the EMS as appropriate given final marina design.

8.2 Objectives of the Environmental Management Plan

The following draft Environmental Management Plan (EMP) details the measures to be adopted to address identified impacts during the construction and operation phases of the project. This Plan is specific to the TMPP and will be finalised following completion of the EIS process as that will assist in identifying the nature and magnitude of potential impacts requiring management.

The EMP provides:

- A practical framework for establishing best practice environmental management standards and guidelines to mitigate potential environmental harm for each activity undertaken;
- A mechanism to assist managers, supervisors and construction crews to comply with current legislation;
- A means of identifying environmental issues and to provide general procedures which must be considered when undertaking construction and operational activities;
- A mechanism to reduce the potential impacts of construction and operational activity; and
- A preliminary basis for establishing environmental due diligence during the construction and operational phases.

In essence, the EMP is to provide the proponent and the contractors with a practical guide to ensure compliance by all parties with the environmental requirements. The EMP achieves this by providing a framework for comprehensive monitoring and control. The aim is to minimise the potential for negative environmental impact on the environment.

The EMP identifies corrective actions if monitoring indicates that the performance requirements have not been met.

8.3 Environmental Training

The proponent will ensure that all employees, subcontractors and visitors receive environmental instruction in relation to the EMP.

Each person will be made aware of and have an understanding of their obligations and duties detailed in this EMP.

8.4 Monitoring Responsibility

The primary responsibility for monitoring the potential impacts of the project will be with the proponent. However, the proponent may contract a third party (e.g. a consultant) to undertake any sampling and analysis and other monitoring works that may be required.

The proponent will be responsible for ensuring that all employees, officers, subcontractors and agents associated with the project are familiar with the elements of the approved EMP and the relevant permits, and comply with these, the requirements of environmental legislation and are committed to ensuring environmentally sound practices are implemented during all activities.

8.5 Auditing

The EMP and its inherent procedures and controls will be audited periodically during construction and operation of the TMPP. An independent auditor will undertake regular auditing as set out in approval conditions. Appropriate action shall be taken to ameliorate any deficiency in implementation of the EMP and any elements that prove to be unworkable. The proponent may audit compliance to the EMP at any time during the project.

8.6 Management Responsibility

A number of parties have responsibilities in relation to the implementation of the EMP. All project staff have a responsibility under the General Duty of Care of the *Environmental Protection Act 1994* and must adhere to the procedures outlined in the EMP at all times.

Specific management responsibilities are summarise in Table 8-2.

Table 8-2 Management Responsibilities

Role	Responsibilities
Principal – the proponent	◗ Implementation and monitoring of the EMP; ◗ Ensure all supervisory and management staff are aware of and understand their responsibilities under this EMP; ◗ Ensure that appropriate and adequate resources are allocated to allow for the effective implementation and maintenance of the EMP; ◗ Ensure periodic reviews of environmental performance are conducted; ◗ Report any major environmental incidents that may have a significant impact on the surrounding environment; ◗ Ensure that its employees and contractors receive the relevant environmental instruction in relation to the EMP and be made aware of and understand their obligations and duties; and ◗ Incorporate appropriate requirements into an EMS for the facility.
Construction Contractor	◗ Be aware of and understand the contents of and the reason for implementing the elements of the EMP and ensure all personnel including subcontractors adhere to these requirements; ◗ Incorporating appropriate requirements into a Construction EMP; ◗ Ensure adequate training in the elements of the EMP is provided to all personnel, including contractors; ◗ Ensure that personnel involved in the project, including subcontractors and visitors, have received any environmental training required to provide them with awareness and understanding of their responsibilities under the EMP as well as understanding of the environmental approvals that adhere to the strategies outlined in the EMP; ◗ Carry out all work in accordance with the procedures outlined in the EMP; ◗ Make sure that all environmental safeguards and precautions are in place and adhered to at all times at the site and activity; ◗ Regularly inspect and monitor all activities for adherence to proper environmental safeguards; ◗ Ensure that all equipment used is properly serviced and that all

Role	Responsibilities
	precautions are in place to prevent the likelihood of an environmental incident occurring; and ◗ Report all environmental incidents to the Superintendent's Representative as soon as practicable, but within 24 hours.
Superintendent's Representative All employees and sub-contractors	◗ Be aware of and understand the contents of and the reason for implementing the elements of the EMP; ◗ Exercise environmental due diligence and achieve compliance with the EMP; and ◗ Report all environmental incidents to the Principal as soon as practicable, but within 24 hours of them occurring.

8.7 Environmental Management Plan

8.7.1 Element 1: Marine Water Quality

8.7.1.1 Potential Impacts

The key potential impacts on water quality will be from dredging, reclamation and spoil disposal and include:

- Depending on the composition of the fill material(s) used to construct the reclamation there may be potential for degradation in the quality of groundwater within the fill material as a result of dissolution of minerals, including metals, and leaching of salts from the fill into groundwater. This could occur if the pH of groundwater within the fill material were to become acidic from infiltration of water through oxidised sulfidic materials;
- Potential for degradation in the quality of the groundwater that will establish within fill placed in Lot 773 as a result of the migration of existing groundwater onto Lot 773 from up gradient sources containing components including dissolved metals, TPH and nutrients;
- Potential for degradation of the quality of surface water in Cleveland Bay as a result of the discharge of groundwater from within Lot 773 to the ocean;
- The generation and migration of turbid plumes during construction and maintenance dredging; and
- The introduction of contaminants into the water column.

8.7.1.2 Performance Objective

To minimise the migration of turbid plumes and the introduction of contaminants in the marine environment (e.g. oils and fuel) during dredging and spoil disposal operations.

8.7.1.3 Management Actions

Construction

- An Acid Sulfate Soils (ASS) Management Plan will be developed which will detail ASS management options and monitoring for dredging and reclamation activities. Considerations should include:

  - Use of clean, non-ASS in preference to PASS with all services and footings;
  - Maintenance of a watertable above the top of the PASS to minimise oxidation;
  - Containment of the PASS to minimise potential for environmental harm;
  - Regular monitoring during reclamation operations and longer term monitoring once the site has been developed, including groundwater monitoring; and
  - If excavation has the potential to disturb placed PASS, an area specific ASS investigation should be undertaken, including appropriate management if required;
- Development and implementation of a Water Quality Monitoring Plan based on water quality objectives detailed in the EIS and any subsequent baseline monitoring;
- Engage appropriate dredging plant to undertake the works in order to minimise the duration of works;
- Precautions should be taken by the dredge to minimise the risk of spillage of pollutants, such as fuels, oils, greases and other chemicals associated with the dredging and spoil disposal operations, into the water;
- Contain all wastes and spillages and implement appropriate storage and disposal practices to ensure no wastes enter marine waters;
- Provide a spill clean-up kit to deal with spills on the dredger;
- Have contact details for the relevant authorities to report any oil spills to water to allow a rapid emergency response;
- Consider removal of soft material from foundation prior to construction of revetment/breakwater to reduce the potential for placement of rock to stir up bottom sediments;
- Clean rock should be utilised to provide the material for the revetment and breakwater walls subject to meeting Queensland Draft Guidelines for the Assessment and Management of Contaminated Land Environmental Investigation Levels, (1998); and
- If a marine based source of fill is used in the reclamation manage and monitor reclamation tailwater quality including use of silt curtains where appropriate and rehandling and disposal of unsuitable finer material from within the finished reclaim.

Operation

- Mooring leases will contain guidelines for boat owners in terms of waste disposal in particular and appropriate disposal facilities will be provided;
- Provision of appropriate waste disposal facilities for moored boats;
- Compliance with the requirements of the Transport Operations (Marine Pollution) Act 2005 and Transport Operations (Marine Pollution) Regulation 2008;
- Use of licensed waste disposal contractors and tracking of wastes where required;
- Installation of oil and grease traps in all workshops;
- Adequate storage and bunding of fuels and oils;
- Appropriate emergency response equipment to be available at all businesses and at the moorings and berths; and

- Defined emergency response procedures for the Marine Precinct.

8.7.1.4 Performance Indicators

- To minimise the duration of elevated turbidity;
- Minimal impact on water quality around the dredge and spoil disposal sites;
- No visible water contamination; and
- The concentration of turbid plumes should not significantly exceed predicted values from modelling.

8.7.1.5 Monitoring

- Monitor suspended sediment concentrations as part of a turbidity monitoring program;
- Monitor water quality at sensitive habitats for compliance to site specific water quality objectives;
- Monitor reclamation tailwater decant water quality;
- Monitor of the potential impacts of dredging on seagrass communities; and
- The Construction Contractor should monitor the operation on a continual basis and will report any incidents that are likely to cause environmental harm to the project location and surrounding areas.

8.7.1.6 Responsibility

- The Project Superintendent is responsible for ensuring the monitoring programs are implemented. The Project Superintendent may subcontract a specialist sub-consultant to undertake the monitoring program; and
- The Construction Contractor is responsible for monitoring the dredging operation.

8.7.1.7 Reporting

- Reports following the monitoring studies are to be sent to relevant agencies;
- Monthly analysis of turbidity monitoring results will be provided to the above agencies; and
- Monthly compliance reports comparing results of water quality monitoring to predicted modelling values will be provided to the Project Superintendent.

8.7.1.8 Corrective Action

- The dredging strategy will be reviewed with appropriate agencies if any adverse impacts, other than those identified within the EIS are observed;
- In the event of an environmental incident (e.g. fuel spillage), implement appropriate contingency and emergency response measures; and
- Implementation of a reactive monitoring program to assess the impacts of dredging and spoil disposal on sensitive habitats.

8.7.2 Element 2: Surface and Ground Water

8.7.2.1 Potential Impacts

Construction of the land based components of the project has the potential to impact on surface-water and groundwater quality off-site if contaminants such as those listed below are accidentally released and are not sufficiently contained:

- Fuel and hydraulic fluid from plant and equipment, fuel storage and refuelling areas;
- Chemicals such as paint;
- Liquid wastes, including sewerage and grey water from the Site Yard; and
- Sediment-laden run-off from construction work sites.

8.7.2.2 Performance Objective

To limit the discharge of contaminated surface-water to the surrounding environment.

8.7.2.3 Management Actions

Construction

- All potentially contaminated water must be collected and treated on site prior to discharge, or removed from site in the event that treatment is not effective;
- All working areas and storage areas will be designed to meet surface-water quality criteria that will be agreed with DERM as part of the Construction EMP;
- As a minimum, design of working areas will include:
  - Dedicated fuel and chemical storage areas that meet the requirements of AS 1940, and are appropriately signed with content and volume. The storage areas will be sited in locations that pose low risk to surrounding waters. All storage areas will be bunded and all associated infrastructure (that is, hoses, pipework, etc) will be contained within the bund. All bunds will contain an oily water interceptor and sump;
  - Spill kits will be available at all fuel and chemical storage areas and will include response equipment specific to the intended purpose. Personnel will be trained in the use of spill kits and in general emergency response;
  - Refuelling of plant, equipment and vehicles will take place in designated areas only (signed, bunded and provided with an interceptor) and in accordance with the documented refuelling procedure. All personnel will receive training on the correct refuelling procedure;
  - All fixed plant will be equipped with drip trays. Drip trays will be checked after significant rainfall events, and any oily water will be collected and disposed of in such a way that prevents contamination of surface waters;
  - All plant and machinery (particularly hydraulic hoses, fuel lines, etc) will be inspected daily and any defaults or signs of wear and tear reported to the Site Foreman for repair as part of a preventative maintenance program;
  - Sewerage and grey water produced at the Site Yard will be collected and disposed of appropriately (e.g. at a Municipal WWTP);

- All oily water collected from sumps, interceptors and drip trays will be disposed at a suitably licensed waste disposal facility;
- As part of the EMP (Construction), the contractor will develop a Stormwater Management Plan prior to construction commencing;
- The minimum requirements for the Stormwater Management Plan are outlined below:
  - As far as reasonably practicable, uncontaminated stormwater will be diverted and/or segregated from work area runoff;
  - Stormwater detention basins will be constructed to collect site runoff and minimise the direct release of stormwater from the site;
  - Excavated soil will be stockpiled in such a way as to minimise release of sediment. There will be no stockpiling in close proximity to watercourses;
  - Pre-construction drainage will be required to divert excess water away from excavations and working areas to minimise sediment-laden run-off; and
  - Any water pumped or drained from excavations will be filtered through a suitable medium (straw bales, break tank, geotextile membrane, or settling pond) prior to being disposed of to vegetated land. There will be no direct discharge of silty water to watercourses.

Operation

- A condition of development of the Marine Precinct will be that industries gain the appropriate environmental approvals and comply with the permit conditions and other relevant guidelines, standards and codes of practice for their industry;
- All owners/operators of activities and industries that establish at the Marine Precinct will be required to prepare and implement an EMP for their activities;
- Mooring leases will contain guidelines for boat owners in terms of waste disposal in particular and appropriate disposal facilities will be provided;
- Provision of appropriate waste disposal facilities for moored boats;
- Compliance with the requirements of the Transport Operations (Marine Pollution) Act 2005 and Transport Operations (Marine Pollution) Regulation 2008;
- Use of licensed waste disposal contractors and tracking of wastes where required;
- Installation of oil and grease traps in all workshops;
- Adequate storage and bunding of fuels and oils;
- Appropriate emergency response equipment to be available at all businesses and at the moorings and berths; and
- Defined emergency response procedures for the Marine Precinct in the event of a spill that could contaminate surface or groundwater.

8.7.2.4 Performance Indicators

- No visible water contamination; and
- Surface water monitoring indicates no significant impacts to surface- water quality based on monitoring results.

8.7.2.5 Monitoring

- All monitoring will compare results against the stated standards; and
- During construction, daily visual site inspections will be carried out to determine if there is any silty run-off from the site visible within the relevant water bodies.

8.7.2.6 Responsibility

- The Project Superintendent is responsible for ensuring the monitoring programs are implemented. The Project Superintendent may subcontract a specialist sub-consultant to undertake the monitoring program.

8.7.2.7 Reporting

- Monthly analysis of water quality monitoring results will be provided to relevant agencies.

8.7.2.8 Corrective Action

- Should any parameters monitored fall outside of the stated water quality standards or differ by 10% or more from the baseline measurement, the EMP (Construction) will be reviewed and amended as necessary.

8.7.3 Element 3: Terrestrial Flora and Fauna

8.7.3.1 Potential Impacts

Expected impacts on terrestrial fauna and flora values from this project are minimal, as the studied area on the east bank of the Ross River will be largely left intact. The values identified for the site largely centre on the mosaic of coastal communities present (mangrove shrublands, sedge/chenopod dominated mudflats, sandy foreshore vegetation and sclerophyll woodland on relict dunes) in a relatively small area, and the likely presence of up to seven species of conservation significance recorded in the area previously. However, these values have been compromised in part by a thorough invasion of several declared and serious environmental weeds.

8.7.3.2 Performance Objective

To limit the negative impacts on the flora and fauna habitat of communities potentially affected by the project.

8.7.3.3 Management Actions

- Limit the clearing of vegetation to that essential for the project;
- Where practicable, locating Site Yard and other project facilities to avoid vegetated areas;
- Install protective fencing in areas that are within the development footprint but are planned for non-disturbance;
- Rehabilitation of disturbed areas of the site where no permanent structures are to be installed, to minimise the total amount of permanent habitat loss;
- Fauna inhabiting the area are to be allowed to relocate naturally. Construction crews will be educated regarding management of fauna (that is, not to kill fauna including snakes);

- All machinery must be thoroughly washed down to accepted industry standards before movement onto the site, and before being moved to another site (using the nearest washdown facility) to avoid translocating or introducing any weed species;
- Topsoil stripped from the site (if any) will be stockpiled separately from subsoil and used for rehabilitation, where practicable. Topsoil stockpiles will be protected from erosion and water-logging to ensure the natural seed bank stored in the soil remains viable;
- Where applicable, on completion of the works, disturbance of rehabilitated areas will be minimised by fencing to facilitate revegetation;
- A weed management strategy will be developed for the operational life of the Precinct to assist in preventing the introduction of weeds and diseases to the site. This should include revegetation of available areas with non-invasive species following construction to minimise potential establishment of pest species and will include a program of weed eradication in affected areas;
- A feral animal management strategy will be developed for the operational life of the Precinct to assist in preventing the introduction of feral animals and diseases to the site. This should include a program of eradication in affected areas and may encompass trapping for feral cats and rats;
- A sediment/silt trapping fence must be erected in the water before any fringing vegetation is cleared to catch sediment clouds; and
- Haul roads must be regularly watered to prevent dust contamination of air and water surface.

8.7.3.4 Performance Indicators

- Disturbance to flora and fauna habitat is restricted to footprint areas and adjacent areas are not significantly impacted;
- No invasive taxa are introduced and, if detected, areas affected are rehabilitated.

8.7.3.5 Monitoring

- For areas of the site that are to be rehabilitated, a photographic record will be prepared prior to construction commencing. This will be used as a baseline against which to measure the success of rehabilitation;
- Following construction for a period of up to two months weekly site inspections of the established Precinct reclamation will be conducted to detect possible invasive weed and other species; and
- On completion of the works, monthly visual inspections of the rehabilitated areas will be carried out, for a period of 12 months. If pest or weed species are determined to be present during inspections an appropriate management response plan will be determined to rehabilitate the affected area.

8.7.3.6 Responsibility

- The Project Superintendent is responsible for implementing site controls.

8.7.3.7 Reporting

- Ensure any fauna injury or mortality is reported to the Project Superintendent and the proponent Representative immediately; and
- The proponent Representative will ensure that the relevant regulatory agencies are informed of the incident within 24 hours including DERM.

8.7.3.8 Corrective Action

- Review of the management actions.

8.7.4 Element 4: Marine and Intertidal Flora and Fauna

8.7.4.1 Potential Impacts

Potential impacts of dredging on marine flora and fauna include:

- Dredging of the sediments and construction within marine waters can remove benthic habitats and the associated species;
- Suspended sediments and sediment deposition can smother benthic organisms, in particular seagrass and benthic infauna;
- Dredging can result in disturbance of marine fauna;
- Marine fauna can suffer direct physical injury through contact with the dredge head or from vessel movement;
- Invasive species may be introduced to an area from dredging works; and
- Increased operational risk associated with pollution discharges from the changed use of the area.

8.7.4.2 Performance Objective

To ensure marine and intertidal fauna and flora is not adversely impacted by construction or operation (maintenance dredging) activity.

8.7.4.3 Management Actions

Construction

- Development and implementation of a dredge management plant to mitigate impacts on water quality;
- Dredging should be undertaken as quickly as possible to minimise the duration of stress to marine flora and fauna;
- Dredging and construction equipment should be free of biofouling considered to be of high risk of carrying invasive marine pests;
- Where cetaceans are identified within proximity to the dredging management of operations will be to avoid contact wherever possible; and
- The area of soft muds on the east side of the river between the sand bank and the inner mouth of the river (See Area B in the Avifauna Assessment as part of the EIS) should not be disturbed if possible. Alteration, diminution or disturbance that affected shorebird feeding on

this section of intertidal flat would represent a significant loss of amenity for shorebirds that frequent the area.

Operation

- Pedestrian access to lands and marine areas on the south east bank of the river may increase as a result of works undertaken for the project (such as the Port Access Corridor). Access to feeding flats and critical shorebird sites should be restricted as part of the project development;
- Implementation and use of designated shipping channels and go slow zones to avoid impacting upon benthic taxa and mobile species, including megafauna;
- Use of appropriate facility design to minimise ongoing pollution potential, including from light spill and slipways;
- Adherence to legislated ballast water discharge requirements, biofouling management guidelines and legislation relating to disposal of waste from vessels (including material scraped from hulls) should be undertaken to minimise the risk of introducing any invasive taxa;
- Implementation of waste management plans and provision of waste facilities;
- Implementation of hazardous material handling requirements and provision of access to appropriate emergency response kits;
- Development and implementation of a maintenance dredge management plant to mitigate impacts on water quality. This plan should consider outcomes of capital and previous maintenance dredging campaigns to identify monitoring and management requirements; and
- Consideration of provision of public access facilities and public education material to mitigate against potential pollution and disturbance impacts.

8.7.4.4 Performance Indicators

- No fauna mortalities or injuries occur during the dredging campaign;
- No marine pest taxa introduced;
- Impacts to the seagrass communities and shorebird sites are minimised; and
- Public assess is restricted from feeding flats and critical shorebird sites.

8.7.4.5 Monitoring

- Implementation of a seagrass monitoring program; and
- Consideration given to ongoing marine megafauna monitoring to assess any influence on habitat utilisation of threatened and listed species.

Townsville is considered a site for ongoing marine pest monitoring under the National System for the Prevention and Management of Introduced Marine Pests. The Precinct area would be captured under that process and, accordingly, no separate monitoring for marine invasive taxa is considered necessary outside of that national framework.

8.7.4.6 Responsibility

- The Project Superintendent is responsible for ensuring seagrass monitoring programs are implemented. The Project Superintendent may subcontract a specialist sub-consultant to undertake the monitoring program; and
- The Project Superintendent is responsible for monitoring public access to restricted areas.

8.7.4.7 Reporting

- Ensure any fauna injury or mortality is reported to the Project Superintendent and the proponent Representative immediately; and
- The proponent Representative will ensure that the relevant regulatory agencies are informed of the incident within 24 hours including the Queensland Parks and Wildlife Service Marine Stranding and Injury Hotline (1300 360 898).

8.7.4.8 Corrective Action

- If marine fauna are spotted during dredging activities, the dredge should avoid moving towards that area if possible if capture or strike is likely; and
- Implementation of a reactive monitoring program to assess the impacts of dredging and spoil disposal on sensitive habitats.

8.7.5 Element 5: Storage and Handling of Hazardous Substances

8.7.5.1 Potential Impacts

Incorrect storage and handling of hazardous substances may result in environmental harm.

8.7.5.2 Performance Objective

- To minimise the potential for environmental harm from the release of hazardous substances to the surrounding marine, terrestrial or air environment;
- Adhere to applicable Australian and other recognised standards, applicable code of practises and relevant statutory provisions, especially the *Dangerous Goods Safety Management Act 2004* and *Workplace Health and Safety Act 1995;*
- Implementation of Identified Hazards;
- Implementation of Safety Management System;
- Implementation of Emergency Response Plan; and
- Preparation of Job Safety Analysis to manage workplace risks.

8.7.5.3 Management Actions

- Implement a Hazard and Operability Study (HAZOP) system during detailed design to identify all potential causes of chemical leakage and spillage or hazards to workers and ensure that appropriate protective systems are implemented.

Construction

- Submit Safety Management Plan to the Department of Emergency Services CHEM Unit for approval prior to the commencement of construction;

- Job Safety Analysis (JSA), safe work instructions, controlled laydown areas and provision of appropriate supervision to be undertaken during construction;
- Hazardous substances handling is to be carried out by suitably trained personnel only;
- Only essential maintenance to be undertaken while on-site;
- Contain all wastes and hydrocarbon spillages and implement appropriate storage and disposal practices;
- Ensure training is provided for handling and storage of hazardous substances to all personnel working on site;
- All hazardous waste (eg: waste oil and maintenance waste such as oily rags and oil filters) shall be retained in secure containers and removed to an appropriate location for disposal to a licensed facility;
- The Construction Contractor is to provide on-site spill clean up kits. All personnel on the site will be familiar with the use of the clean up kit and dispose of waste in the prescribed manner; and
- Copies of MSDS for all hazardous materials to be maintained on-site.

Operation

- Develop a Safety Management System for operation of the TMPP;
- Develop an Emergency Response Plan in conjunction with local authorities and emergency services. Submit Emergency Response Plan to the Department of Emergency Services CHEM Unit for approval prior to the commencement of construction; and
- Maintain the hazardous goods storage area in a clean, safe and environmentally acceptable manner.

8.7.5.4 Performance Indicators

- Maintain a training register for all staff and contractors.

8.7.5.5 Monitoring

- The Construction Operator shall regularly visually monitor the area around the construction site for hydrocarbon spillages;
- The Principal will undertake regular monitoring of the performance of staff, tenants and contractors in terms of compliance with Safety Management System; and
- The Principal will undertake periodic inspection of storages, pipelines and connections of chemical storages, chemical storages designed in accordance with Australian Standards and *Dangerous Goods Safety Management Regulation 2001*.

8.7.5.6 Responsibility

- The Construction Contractor is responsible for monitoring the storage and handling of hazardous substances on the construction site; and
- The Principal is responsible for monitoring the storage and handling of hazardous substances within the operational Precinct.

8.7.5.7 Reporting

- Daily or weekly reports (as appropriate) will be completed on-site and reviewed by each Supervisor and / or Superintendent for the duration of construction activity;
- Immediately notify the Principal and DERM in the event of an uncontained spill;
- All spills should be reported immediately to the Project Superintendent and cleaned up with the contaminated materials removed and disposed to an approved site;
- In the event of a spill the Construction Contractor is to complete an Environmental Incident Report and Corrective Action Report and forward on to the Project Superintendent;
- Incident or non-compliance corrective action shall be closed out by senior management according to an agreed responsibility and timescale; and
- Workplace Health and Safety representative will be responsible for enforcing all occupational and public health directives and keeping all related records and communications.

8.7.5.8 Corrective Action

In the event of an incident or failure to comply, a selection of the following actions will be undertaken as appropriate:

- Investigate why the incident occurred and investigate and implement mitigating measures;
- Ensure safety information provided is adequate and up-to-date and revise regularly as appropriate;
- Ensure employees, contractors and visitors to the site are familiar with the procedures and policies relevant to their positions; and
- Ensure safety directives and procedures are enforced; and ensure safety documents are readily available to everyone on the site.

8.7.6 Element 6: Waste Management

8.7.6.1 Potential Impacts

Incorrect handling and storage of waste materials may result in the introduction of wastes into the marine environment.

8.7.6.2 Performance Objective

To ensure best practice management for the handling and storage of all waste materials on the construction site and Precinct.

No waste, other than treated wastewater is to be released into the marine waters.

The waste facilities catering for shipping and boating (commercial and recreational), should be able to receive MARPOL 73/78 Annex V wastes (garbage) and Annex I wastes (waste oil and oily mixtures) as well as being capable of handling any other wastes in the quantities that would normally be handled or discharged (e.g. by a fleet of 50 trawlers and 40 potential recreational berths / pile moorings).

Management of shipping and boating wastes should meet the ANZECC (1997) *Strategy to Protect the Marine Environment – Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand*.

Waste management at the commercial and industrial facilities at the marina including boat building, maintenance, repair facilities, restaurants and seafood processing or markets must comply with the regulations outlined in the Waste EPP.

8.7.6.3 Management Actions

Construction

- Collection and disposal of waste from the construction site and the Precinct facility should be by a licensed contractor and disposed of at a licensed waste disposal facility;
- Ensure that all construction wastes and rubbish is contained in bins or other appropriate containers; and
- Ensure the removal of all rubbish and other waste from the dredge to an appropriate location at the cessation of dredging and spoil disposal.

Operation

- Ensure general solid waste receptacles are provided for marina operation, including galley waste;
- Receptacles for all types of waste received at the facility should be clearly labelled and sign posted. Furthermore waste storage areas should be designed so that wind and pests including birds and other animals cannot cause spreading of waste and disease;
- Information on the correct use of each facility should be displayed and readily visible on signs at the containers or receptacles;
- Additional facilities should be provided for recycling and/or reuse of suitable materials including glass, aluminium and steel, paper, plastic and batteries; and
- Liquid waste reception facilities should be provided to cater for sewage and other liquid wastes at the marina.

8.7.6.4 Performance Indicators

- All waste materials are handled and stored in a safe and appropriate manner; and
- There is no environmental impact on, and disturbance to, the surrounding marine area from waste.

8.7.6.5 Monitoring

- The Construction Contractor will monitor the storage of waste materials including the disposal of waste from on board the dredge and other floating plant; and
- The Principal will monitor the management and disposal of waste for the marina facility.

8.7.6.6 Responsibility

- The Construction Contractor is responsible for ensuring the appropriate waste handling and storage procedures are implemented on the construction site; and

- The Principal is responsible for ensuring the appropriate waste handling and storage procedures are implemented on the marina facility.

8.7.6.7 Reporting

- In the event of the release of wastes into the marine environment, the Construction Contractor is to complete an Environmental Incident Report and Corrective Action Report and forward on to the Project Superintendent; and
- The Principal to immediately notify the DERM in the event of an uncontained spill.

8.7.6.8 Corrective Action

- Implement appropriate management and preventative measures to reduce the potential for an environmental incident.

8.7.7 Element 7: Noise

8.7.7.1 Potential Impacts

Dredging and construction activities may result in increased noise levels at surrounding facilities. Construction activities may reduce the amenity of surrounding areas.

Operation of the marine precinct has the potential to impact on the amenity of nearby noise sensitive receivers in South Townsville and occupants of the marine precinct (fishing trawlers) without appropriate management procedures in place.

8.7.7.2 Performance Objective

To reduce or minimise the impact of noise associated with the dredging and construction activity on surrounding facilities, users and visitors.

In order to protect the amenity of nearby sensitive receivers, any user of the marine precinct shall ensure operational noise levels do not exceed the project specific noise criteria of LAeq 1hr day – 46dB, $L_{Aeq\ 1hr}$ evening – 40dB, and $L_{Aeq\ 1hr}$ night – 28dB for South Townsville and of $L_{Aeq\ 1hr}$ day – 48dB, $L_{Aeq\ 1hr}$ evening – 45dB, and $L_{Aeq\ 1hr}$ night – 31dB for the trawler berths.

8.7.7.3 Management Actions

Construction

- Normal construction hours will be 6.30 am to 6.30 pm Monday to Saturday. All work outside of these hours will require approval in advance by the appropriate authority, and will need to comply with the stated noise limits;
- Dredging, reclamation and protective rockworks are proposed to be conducted 24 hours a day, 7 days a week;
- Prior to the opening of Townsville Port Access Road (TPAR), vehicle deliveries are expected to be routed through South Townsville during normal construction hours;
- Where practical, prior to the TPAR opening, all vehicle movements to and from the construction site must be made only during normal working hours;
- Subsequent to the opening of the TPAR, vehicle deliveries are expected to include traffic routed on the TPAR 24 hours a day, 7 days a week;

- Ensure that all equipment is properly maintained and silencers are operational and put in place action plan if requirements are not met;
- Long term fixed plant should be appropriately located so as to minimise noise impacts on the nearest sensitive receivers;
- Maintain and operate all equipment on board the dredge in a safe and efficient manner;
- Carry out non-essential maintenance during day-light hours;
- All plant and machinery will be turned off when not in use. Equipment found to be producing excessive noise will be taken out of use, and repaired or removed from site; and
- Residents should be notified of the construction timetable, particularly when noisy activity is to be undertaken such as pile driving.

Operation

- Potentially noisy Precinct users should be located the furthest away from the nearby sensitive receivers;
- Where practicable, limit operating times of noisy industries using the site (i.e. day time only);
- Provide public awareness notice for recreational boat users accessing the site at night; and
- Development approvals for individual sites should be subject to a noise assessment to ensure that all industrial premises on the marine precinct cumulatively comply with the noise criteria.

8.7.7.4 Performance Indicators

- Absence of complaints from people directly affected by construction and operation noise.

8.7.7.5 Monitoring

- Maintain a record of any noise complaints in a log book, including the date and time of complaint, name of complainant, nature of complaint, action taken and follow up; and
- Where required, upon receipt of a noise complaint monitoring should be undertaken within 3 to 5 working days. If exceedances are detected, the source should be investigated and equipment and operational procedures reviewed to identify means of reducing noise to acceptable levels.

8.7.7.6 Responsibility

- The Project Superintendent is responsible for logging and responding to all noise complaints during construction; and
- The Principal is responsible for logging and responding to all noise complaints during operation.

8.7.7.7 Reporting

- All construction phase complaints are to be reported to the Project Superintendent;
- All operational phase complaints are to be reported to the Principal; and
- Maintenance of a record of any noise complaints in a log book.

8.7.7.8 Corrective Action

- All complaints are to be responded to within 24 hours of receiving the complaint;
- Maintain all equipment so that noise levels do not exceed specified guidelines; and
- Modify operational practices where appropriate.

8.7.8 Element 8: Air Quality

8.7.8.1 Potential Impacts

Air emissions, including dust, will be generated on site during construction and could potentially impact on nearby sensitive receptors.

8.7.8.2 Performance Objective

To minimise the air emissions produced during dredging operations and construction activity to ensure that ambient air quality is maintained in the vicinity of the Marine Precinct construction zone.

8.7.8.3 Management Actions

- All plant and equipment will be regularly serviced and well maintained in order to reduce emissions of greenhouse gases;
- Haul routes to be defined and located to minimise disturbance to sensitive areas;
- Vehicular speeds will be limited to 20 km/h on areas of unconsolidated or unsealed soil associated with the immediate site works;
- Regular sweeping of access roads to ensure material is not transported onto roads around the site;
- Water spraying will be utilised as required (that is, when in close proximity to sensitive receptors such as houses) to dampen dust on working areas and/or access tracks;
- Review of daily weather updates from the Bureau of Meteorology, or a private meteorology service provider, to give warning of likely strong winds to assist with daily management of wind blown dust from unconsolidated soil surfaces and material stockpiles; this includes:
  - All haulage vehicles are to have their loads covered while transporting material to the work area;
  - Southern site boundary fence to be 3 m high and cyclone-mesh fence with 90% shade cloth covering;
  - Areas of disturbed soil, stockpiles and temporary spoil containment are to be covered by mulch or tarpaulins as best as practicable; and
  - If necessary to meet environmental management requirements, earthworks will cease during strong wind conditions.

8.7.8.4 Performance Indicators

- All local dust complaints responded to within 12 hours; and
- Mitigation measures implemented within 24 hours of receiving a verified dust complaint.

8.7.8.5 Monitoring

- Visual inspections of working areas and access tracks will be carried out regularly to monitor dust levels;
- Visible observations of dust moving off-site; especially during dry and/or windy weather;
- Daily audit of mitigation equipment and dryness of exposed surfaces by site manager; includes logging complaints and action taken;
- Dust deposition gauges operated in front of representative residences if construction activity likely to be within 500 m for more than 30 days; and
- Free-call number available for public complaints.

8.7.8.6 Responsibility

- The Project Superintendent is responsible for visual monitoring and control of emissions from the construction site.

8.7.8.7 Reporting

- The Construction Contractor is to report any visible emissions from the site to the Project Superintendent; and
- A community complaints register will be maintained in order to identify areas where dust management is a significant problem.

8.7.8.8 Corrective Action

- Stabilisation of surface silt content through application of localised water sprays, or the use of appropriate chemical dust suppressants (suitable for stockpiles and spoil dumps);
- Control of mechanically induced dust emissions (from clearing, scraping, excavation, loading, dumping filling and levelling activities etc.) by application of water sprays; and
- Awareness of operational areas more frequently exposed to higher winds, and the predominant wind directions in these areas at various times of the year. Temporary wind barriers may be employed where necessary.

If a higher level of control is deemed to give added protection to residential areas to the south of the site, particularly if sealing the entry road is impracticable, a high-level of dust control can be achieved by developing a proactive and reactive dust management regime. This measure involves real-time particulate monitoring using a real-time aerosol monitor, with PM10 size selective inlet, which will be located between construction operations and identified sensitive receptor sites (near Boundary Street and Eighth Avenue).

The real-time monitor can be configured to provide a warning (via an audible, or visible signal or as a communication link) of short-term elevations in concentrations of respirable dust so that immediate dust suppression and remediation steps can be initiated. Reactive mitigation measures may include application of water sprays, reducing the intensity of operations, or even altering the type of construction operations until suitable meteorological conditions prevail. The threshold particulate concentration for alarm/warning activation would be based on a criteria level established by the Coordinator-General as an intervention level for respirable dust; typically 150mg/m^3 as a short term (15-minute) trigger which will result in the daily dust exposure being below the daily EPP (Air) limit.

If a higher level of control is deemed required, the following actions could be implemented:

Real-time dust monitoring conforming to:

- Australian Standard AS2922-1987 Ambient Air – Guide for the siting of sampling units; and
- AS/NZ 3580.12.1 2001 Methods for sampling and analysis of ambient air Method 12.1: Determination of light scattering - Integrating nephelometer method.

All other monitoring and reporting for 'typical' management including: visible observations; daily audits; dust deposition gauges; logging complaints and corrective actions; and public free-call number.

When real-time monitoring indicates PM10 dust levels above 150mg/m^3 over a rolling 1-hour average:

- Increase water application rates;
- Reduce speed restrictions on vehicular traffic to 10 km/h; and
- Cease mechanically generated dusty activity.

8.7.9 Element 9: Environmental Emergency Procedures

8.7.9.1 Potential Impacts

Environmental incidents have the potential to result in environmental harm during construction and operation.

8.7.9.2 Performance Objective

To identify and reduce the potential for an environmental incident before it occurs so as to prevent damage to the surrounding marine environment and the public.

To respond quickly and effectively in the event of an emergency or environmental incident.

8.7.9.3 Management Actions

Construction

- Prevent and reduce the potential for an environmental incident by ensuring the implementation of Best Practice Management throughout the construction and dredging operations and by implementing the EMP;
- The Construction Contractor is to suspend, relocate or amend dredging operations immediately if an environmental incident occurs that may be aggravated by continued dredging operations;
- The Construction Contractors is to notify the Project Superintendent and relevant emergency response agencies immediately in the event of an environmental incident;
- Initiate response and corrective action procedures pending the Project Superintendent and the proponent's directive;
- Identify any near miss incidents and put in places corrective actions to prevent reoccurrence;
- The Construction Contractor shall:

- Retain only the minimal required quantities of chemicals, fuels, oils etc at construction sites or contractor laydown areas at any particular time;
- Store fuels, lubricants and chemicals in appropriate containment facilities away from water storage areas and at a distance of 100 m from natural or built waterways;
- Undertake maintenance and servicing of vehicles at Contractor laydown areas or other appropriate facilities. Daily servicing only may be undertaken on site; however such activity will be undertaken at a minimum separation distance of 100 m from drainage lines or waterways;
- Ensure safe handling techniques during refuelling to prevent spillage;
- Immediately clean up petroleum product spillages with dry absorbent materials or sand or have the area remediated;
- Place absorbent materials used in the clean up of hydrocarbons or other chemicals in an appropriate container marked 'regulated waste' and consign to a waste contractor licensed to receive such waste;
- Store chemicals and fuels in accordance with AS:1940 – The storage and handling of flammable and combustible liquids;
- Locate Material Safety Data Sheets (MSDS) at the Site Construction Office / Site Administration Office for all hazardous and dangerous goods stored and used;
- Ensure temporary chemical storage is in accordance with Material Safety Data Sheets (MSDS) and store non-compatible chemicals separately, as required;
- Clean up spills in accordance with relevant Material Safety Data Sheets and Australian Standard AS:1940;
- Isolate chemical spills that occur in bunded areas from the trade waste system and ensure that the contaminated wastewater is removed by a licensed contractor;
- Contain and collect spills of hazardous materials for treatment at a licensed waste disposal facility;
- In the case of a spill to ground, initiate clean up immediately and seek the advice of a qualified professional to minimise the risk of groundwater contamination;
- Ensure spill kits including containment and treatment equipment and materials are available near hazardous materials storage areas;
- Provide totally enclosed containment for all waste; and
- Ensure persons handling dangerous chemicals wear appropriate PPE and receive appropriate training in its use.

Operation

- A number of Emergency Response Plans will be prepared for the Marine Precinct by the Principal to guide those responding to a variety of potential emergency situations. These include:
  - A Chemicals and Fuel Spill Emergency Response Plan. This plan will detail the specific planning, training and response requirements for oil spill management;
  - A Fire/Explosion Emergency Response Plan;
  - A Total Power Outage Emergency Response Plan; and

– A Natural Hazard Emergency Response Plan; and

- The Principal will prepare a suitable spill containment and cleanup procedure for the proposed Marine Precinct.

8.7.9.4 Performance Indicators

- Maintain public and navigational safety;
- Maintain the ecological integrity of the surrounding marine environment;
- Minimise the potential for an environmental incident;
- Correct storage of fuel or chemicals including updated MSDS;
- Implementation of bunding, spill response training and spill response kits; and
- Facilitate the timely and effective implementation of the appropriate emergency response procedures in the event of an environmental incident.

8.7.9.5 Monitoring

- The Construction Contractor or Workplace Health & Safety Officer shall regularly inspect all temporary chemical and petroleum product storage areas for leakages and release any clean stormwater accumulated in temporary bunded areas, after each rainfall event. Environmental Representative shall also audit the contractor's procedures to check for compliance;
- Monitor and record all unusual and inappropriate procedures and events; and
- The Principal to undertake regular monitoring of the performance of staff, tenants and contractors in terms of compliance with the Emergency Response Plans.

8.7.9.6 Responsibility

- The Construction Contractor is responsible for monitoring for and immediate response to all environmental incidents under the direction of the Principal; and
- The Principal is responsible for ensuring the implementation and monitoring of the Emergency Response Plan.

8.7.9.7 Reporting

- The Construction Contractor will report environmental incidents to the Principal and relevant government agencies immediately;
- In the event of an environmental incident, the Construction Contractor is to complete an Environmental Incident Report and Corrective Action Report and forward on to the Project Superintendent; and
- Incident or non-compliance corrective action shall be closed out by the Principal according to an agreed responsibility and timescale within the facility EMS.

8.7.9.8 Corrective Action

- The Project Superintendent and/or Principal will determine the appropriate emergency response and corrective actions to be implemented depending on the type and magnitude of the event; and

- Establish twenty four (24) hour contact details for the Project Superintendent (eg: mobile phone and pager).

8.7.10 Element 10: Visual and Amenity

8.7.10.1 Potential Impacts

Impacts on visual amenity as a result of construction activity including equipment and stockpiles.

Conflict between site design and the existing amenity values.

8.7.10.2 Performance Objective

To reduce and/or manage adverse visual impacts of construction and operation on landscape and visual amenity.

To achieve a balance between the site design and use requirements and achieving an optimal visual outcome so as to minimise the detrimental effects on the landscape and visual character.

8.7.10.3 Management Actions

Construction

- Avoid loss or damage to landscape features including minimisation of clearance of mangroves. Where possible, protect trees prior to construction and/or trim vegetation to avoid total removal;
- Temporary hoardings, barriers, traffic management and signage to be removed when no longer required;
- Materials and machinery to be stored tidily during the works;
- Lighting of work sites is restricted to approved working hours and those which are necessary for security;
- Roads providing access to the site and work areas to be maintained free of dust and mud as far as reasonably practicable, and dust management techniques to be used; and
- Use of appropriate soil erosion prevention techniques.

Operation

- Building and structure design should respond to the surrounding environment with consideration to viewpoints through consideration of:
  - Building form and style;
  - Finish, including use of less reflective materials, appropriate colours, textures, and roofing; and
  - Building bulk and location.
- Establishment of landscaping works as soon as possible after the completion of construction operations, or if appropriate, during the construction stage;
- Mitigation of light pollution through:
  - Appropriate lighting design to ensure the site is not over-lit;

- Use of specifically design lighting that minimises the spread of light and glare towards visual receptors;
- Specify appropriate luminaries to reduce light spill, sky glow and glare;
- Consider the potential for solar power for lighting; and
- Sensitive placement and specification of lighting to minimise any potential increase in light pollution within the natural environment.

8.7.10.4 Performance Indicators

- No complaints received about visual impacts during construction; and
- No complaints about light spill from operation.

8.7.10.5 Monitoring

- Visual inspections of the construction area to ensure no vessels are within the area.

8.7.10.6 Responsibility

- Project Superintendent is responsible for ensuring that construction activities are planned and undertaken so as to minimise visual impact; and
- The Principal is responsible for ensuring visual impacts are considered in the facility design and that the design is sympathetic to the surrounding land uses.

8.7.10.7 Reporting

- The Project Superintendent to advise the Principal of any complaints.

8.7.10.8 Corrective Action

- Tidy up construction site; and
- Restore or rectify areas of damage.

8.7.11 Element 11: Traffic and Site Access

8.7.11.1 Potential Impacts

Construction and operational traffic will not exceed road design capacities for road interfaces with the external road network. Based on the results of the traffic impact study, the development can take place with no significant impact on the external road network.

Minor interruptions to commercial and recreational fishing activity are possible during construction.

Potential risks to safety if unauthorised vessels are too close to the dredge or disposal areas.

8.7.11.2 Performance Objective

To maintain functionality of the internal and external road network.

To prevent the access of unauthorised vessels too close to the dredge spoil disposal area and construction sites.

Ensure that dredging operations do not unduly interfere with vessel movements in the Port.

8.7.11.3 Management Actions

Construction

- MSQ to provide a notice to mariners advising the commencement of construction and expected duration of operations;
- The Project Superintendent is to place a public notice prior to works commencing; and
- Dredge operator to liaise with the Harbour Master regarding vessel movements.

Operation

- A roundabout or signalised intersection is the recommended option for the Benwell Road / Archer Street intersection as it allows for the greater free flow of traffic and provides for the best operating conditions when compared to priority intersections;
- The recommended option for the Benwell Road / Secondary Access intersection is a give-way priority intersection which will provide satisfactory conditions for all approaches is likely to be the most affordable option; and
- Additional studies on the intersection between Boundary Street and Saunders Street will be require to assess future traffic management needs.

8.7.11.4 Performance Indicators

- All vessels remain well clear of the dredging and disposal sites;
- No complaints received about shipping access to and from the Port during construction; and
- No complaints regarding road function within and leaving the port/marina precinct.

8.7.11.5 Monitoring

- Visual inspections of the construction area to ensure no vessels are within the area; and
- Traffic monitoring during marina operation to confirm the outcomes of the traffic study should intersection queues cause complaint.

8.7.11.6 Responsibility

- MSQ and the Project Superintendent are responsible for ensuring that notice of the dredging works is provided to all users and visitors to the Port;
- The Construction Contractor is responsible for liaising with the Harbour Master regarding vessel movements; and
- The Principal for ensuring adequate internal traffic design capacity and functionality.

8.7.11.7 Reporting

- MSQ are to advise the Project Superintendent of any complaints or incidents.

8.7.11.8 Corrective Action

- Increase the number of signs/buoys and/or relocate them to ensure they are effective;
- Contact boat owners who approach too close and explain the hazards; and
- Remodel traffic study.

8.7.12 Element 12: Management and Staff Responsibilities

8.7.12.1 Potential Impacts

Ineffective or inadequate communication will restrict the management of environmental incidents and Port access during the construction program potentially placing people and the environment at risk.

8.7.12.2 Performance Objective

To ensure that there is an identifiable chain of command and available procedures in place for communication and reporting of environmental issues during construction.

To ensure that adequate information is available to boating users as to the duration and nature of the operation and any restrictions placed on port users.

8.7.12.3 Management Actions

- A written chain of command indicating authority and responsibilities should be available for both the Project Superintendent, the Construction Contractor and Harbour Master. This is to be established with the Construction Contractor prior to the commencement of works;
- The Project Superintendent is to be responsible for ensuring that all relevant staff and the Construction Contractor are familiar with reporting procedures and comply with the EMP and all approval and permit conditions;
- The Construction Contractor is to inform the Project Superintendent of any environmental incident or a potential environmental incident, which has the potential to cause environmental harm as soon as possible;
- On-site personnel are responsible for reporting an incident or potential incident if he/she is the first to notice or cause an incident;
- Report forms are to be available on-site at all times;
- Report forms are to include:
  - A complaints register;
  - An environmental incident and corrective action report; and
  - A site inspection/progress report.

8.7.12.4 Performance Indicators

- The Project Superintendent, the Construction Contractor and Harbour Master know the procedures for communication of information between all relevant parties;
- The establishment and implementation of a practical framework for the reporting and amelioration of potential environmental incidents is in place; and
- All regular operators in and out of the harbour are aware of the nature and duration of the operation and any restrictions that may apply during the operation.

8.7.12.5 Monitoring

- The Project Superintendent is responsible for ensuring that reporting procedures are being followed.

8.7.12.6 Responsibility

- The Project Superintendent is responsible for ensuring that reporting procedures are being followed.

8.7.12.7 Reporting

- The Project Superintendent is responsible for ensuring that reporting procedures are being followed.

8.7.12.8 Corrective Action

- The Project Superintendent should ensure that the Dredge Operator and subcontractors are familiar with reporting procedures; and
- Modify reporting procedures as required.

8.7.13 Element 13: Staff Environmental Training

8.7.13.1 Potential Impacts

Environmental impacts are not appropriately mitigated due to lack of staff and contractor awareness and training.

8.7.13.2 Performance Objective

To ensure that relevant Project Superintendent staff and Construction Contractor personnel are adequately trained in environmental awareness with regard to the marine environment.

To ensure Marine Precinct tenants are appropriately aware or notified of management requirements for the Precinct.

8.7.13.3 Management Objectives

- Appropriate environmental training appropriate to the Project should be given to all personnel involved in construction and associated operations;
- The Project Superintendent is to ensure that tenant environmental training needs are identified and addressed; and
- The Principal is to ensure that environmental training needs are identified and addressed.

8.7.13.4 Performance Indicators

All relevant Project Superintendent, staff Construction Contractor personnel and tenants understand the environmental issues associated with the proposed marina construction and operation.

8.7.13.5 Monitoring

- The Project Superintendent should ensure that the Construction personnel have been given adequate training in the areas outlined above and are familiar with the EMP and their environmental responsibilities; and
- The Principal should ensure that tenants have been given adequate training in the areas outlined above and are familiar with the EMP and their environmental responsibilities.

8.7.13.6 Responsibility

- The Project Superintendent is responsible for ensuring that the Construction personnel have been given adequate training in the areas outlined above; and
- The Principal is responsible for ensuring that tenants have been given adequate training in the areas outlined above.

8.7.13.7 Reporting

- The Project Superintendent should maintain records of staff and contractors who have undergone training in relation to the EMP and general environmental responsibilities.

8.7.13.8 Corrective Action

- The Project Superintendent and Construction Contractor should ensure that anyone who appears to lack an understanding in the above areas undergoes adequate retraining.

8.7.14 Element 14: Cultural Heritage

A draft Cultural Heritage Management Plan (CHMP) has been prepared as part of this project. The proponent is required to implement the CHMP in conjunction with Traditional Owners and DERM.

8.7.15 Element 15: Greenhouse Gas Management

8.7.15.1 Potential Impacts

Greenhouse gas emissions are not appropriately managed to reduce release.

8.7.15.2 Performance Objective

To ensure best practice management for the conduct of activities that have potential to release greenhouse gas (GHG) emissions.

Management of emission generating activities should address legislated standards for emissions release with reporting of emissions if annually more than 125 kilotonnes CO_2-e, in accordance with the National Greenhouse and Energy Reporting (NGER) Act (2007).

Adherence to the Queensland Government *ClimateSmart* 2050 climate change strategy.

Precinct industries releasing emissions must comply with any regulations introduced regarding emissions over the lifespan of the Precinct's operation.

8.7.15.3 Management Actions

Construction

- Minimise emissions by reducing transportation distances for imported material where possible; and
- Assess potential emissions for different construction approaches and adopt the least impactive approach, particularly for dredging scenarios.

Operation

- Consider use of solar solutions for lighting and other energy requirements within the Precinct;
- Consider smart sharing solutions for emission generating activities (including ventilation, air-conditioning) among users of the Precinct during detailed design for construction of topside facilities;
- Apply energy efficient and GHG emission considerations to the purchasing of equipment used onsite at the Precinct; and
- Train operators in energy efficient practices, including minimisation of lighting requirements during non-critical periods, to reduce overall GHG emissions.

8.7.15.4 Performance Indicators

- GHG emissions are minimised.

8.7.15.5 Monitoring

- The Construction Contractor will monitor activities and adopt approaches to minimise impacts;
- The Principal will report annual GHG emissions if required under the NGER Act (2007); and
- Review of GHG emissions, conduct of audits, and review of facilities as required during the operational life of the Precinct to continue to meet ongoing legislative requirements, which may be subject to change.

8.7.15.6 Responsibility

- The Construction Contractor is responsible for ensuring the appropriate approach to construction activities to minimise GHG emissions, where able; and
- The Principal is responsible for ensuring the appropriate reviews or audits are conducted during the operational phase.

8.7.15.7 Reporting

- In the event of the release of annual GHG greater than 125 kilotonnes CO_2-e, the Principal will complete reporting in accordance with the NGER Act (2007).

8.7.15.8 Corrective Action

- Implement appropriate management and preventative measures to reduce the potential for excessive emissions.