



Port of Durban

EMP Guidelines

(Construction, Operational & Decommissioning)

Preface

The Environmental Department (HQ) started to develop an Environmental Management Framework (EMF) to incorporate environmental management within TNPA processes. Through this process, it was realized that this sectorial approach was not the most adequate to implement sustainable development within TNPA core business. The decision was then taken to adopt a more integrated and comprehensive approach to address sustainability challenges within TNPA. This strategic shift is the rationale behind the development of a Sustainability Management Framework (SMF).

The SMF purpose is to indicate and clearly depict how and where intervention is required into internal business unit process in order to effectively address sustainability related matters and provide guidance to achieve the sustainable development objectives of the Transnet National Ports Authority.

Abbreviations:

1. **SMF:** Sustainability Management Framework
2. **EMS:** Environmental management System
3. **EMP:** Environmental Management Plan/Program
4. **CEMP:** Construction Environmental Management Plan
5. **OEMP:** Operations Environmental Management Plan
6. **DEMP:** Decommissioning Environmental Management Plan
7. **Enviro:** Environment/Environmental
8. **SEA:** Strategic Environmental Assessment
9. **EIA:** Environmental Impact Assessment

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1. Introduction

Most of the global environmental assessment practice appears to be directed at the scoping and assessment stages of EIA's. The mitigation, monitoring and management components of EIA's receive less attention. Attention is now being focused on the need to demonstrate that impacts can be monitored and managed. The EMP is recognized as the tool that can provide the assurance that the project proponent has made suitable provision for mitigation. The EMP is the document that provides a description of the methods and procedures for mitigating and monitoring impacts. The EMP also contains environmental objectives and targets which the project proponent or developer needs to achieve in order to reduce or eliminate negative impacts. The EMP document can be used throughout the project life cycle. It is regularly updated to be aligned with the project progress from construction, operation to decommissioning. EMP's provide a link between impacts predicted and mitigation measures specified in the EIA report, or risk assessment and the implementation and operational activities of the project. EMP's outline the environmental impacts, the mitigation measures, roles and responsibilities, timescales and cost of mitigation.

Three broad categories of EMP's can be recognized in the project lifecycle. They are the construction phase EMP, operational phase EMP and decommissioning EMP. The main objectives of these EMP's are all the same, namely to:

- Identify the possible environmental impacts of the proposed activity; and
- Develop measures to minimize, mitigate and manage these impacts.

The difference between these EMP's is related to the difference in mitigation actions required for the different stages of the project life cycle.

The development and implementation of a successful EMP has benefits beyond merely meeting legal obligations. EMP's are not just required for developments and projects that have undergone an EIA but according to NEMA all activities and development affecting the environment in a negative way must have an EMP. An EMP also contributes to environmental awareness of the workforce and empowers and educates employees on the importance of protecting the environment against possible negative impacts.

2. EMP Development

It is the stated goal of Transnet National Ports Authority (TNPA) to implement sustainable environmental management practices within all South Africa's commercial ports. This applies to the planning, design, construction, operation, restoration, reuse and decommissioning activities and the development of port related infrastructure.

These guidelines indicate the matters that should be considered in preparing construction and operational environmental management plans (EMP's). These guidelines are not definitive but provide guide to the basic requirements for EMP's.

It is important to note that all development undertaken on port land will require a construction, operational and decommissioning EMP. All these documents will be captured within the lease agreements signed between the parties. With regards to the decommissioning EMP, it might not be possible and necessary for it to be formulated and submitted for approval at initiation of project but at a reasonable timeframe (e.g. 6 months-short term leases, 2 years long term leases) before decommissioning and vacation of land or infrastructure. The scope and terms of reference can however be agreed upon signing of the lease. An EMP should always be prepared specifically for the location where the development occurs, having regard to the specific nature of the development activities. Generic and non-site-specific EMP's will not be accepted.

Depending on the nature of construction and operation of the proposed development, technical information may need to be provided. Specialised consultants may need to be engaged to prepare this information.

It is important that anyone requiring or preparing an EMP consider consulting with the Environmental Staff of the Transnet National Ports Authority of South Africa (TNPA). This will allow timely assessment of the EMP and prevent delays as well as submission of unnecessary information. The organization may also be able to assist you in preparing your EMP or have information that you need.

3. Environmental Impact Assessments (EIA's)

EIA's are required for certain types of developments in terms of the Environmental Management Act (Act 109 of 1998) as amended in GNR 385,386 and 387. This set of legislation lists some activities that are subject to the EIA process. Examples of some of these activities are construction in a sensitive area, development of structures below the high water mark e.g. quays, moorings, breakwaters, etc.

The National Environmental Management Act (NEMA) also requires that all construction or development works be accompanied by an EMP irrespective of the nature and scale, so even if an activity does not feature in the ECA's listed activities it still requires environmental controls to be in place. These CEMP or method statements can also be sent to the Dept of Environmental Affairs and Tourism (DEAT) for approval.

4. Construction EMP's

4.1 Background

A construction EMP (CEMP) is a practical and achievable plan of management to ensure that any environmental impact during the construction phase is minimized. The CEMP is accompanied by Method Statements which depicts or describes mitigation measures for their proposed operational methods.. In preparing a CEMP, consideration should be given to the issues discussed below. The CEMP must be site specific and detail measures that will be employed on the site to minimize any adverse environmental impact. Importantly, the CEMP must include a "schedule of works" indicating the timing of the construction activity.

For construction and development activities which are initiated by TNPA itself a Construction Environmental Specification (ES) will be compiled. These ESs incorporate specifications, together with guidance for "good environmental practice" for construction work. It will be prepared by the TNPA Environmental Department which will be responsible for the preparation of tender documentation for the construction of infrastructure. The successful contractor will then be required to submit a CEMP to TNPA to indicate how they intend meeting the TNPA requirements, as stipulated in the ES. In essence this ES will act as the EMP which then indicates the environmental requirements that will need to be met in undertaking the works. The complexity and detail of the ES will vary, based on the nature and scale of the project. In some cases this ES can also be drawn up by independent consultants or alternatively sent for external review.

For construction activities based on application or proposal from an external client or tenant

this guide will aid contractors in drawing up an EMP in line with the requirements of TNPA. As mentioned before the EMP must be specific to nature and scale of development as well as be accompanied by an EMP for the operational phase (OEMP). More of the operational EMP (OEMP) will be discussed further in the document.

4.2 Purpose

The purpose of the CEMP is to ensure good environmental management practices are undertaken with all works done in the port and that minimal impact is inflicted on the environment. It also ensures adherence to TNPA Environmental Policy, legislative requirements and those objectives from Strategic Environmental Assessments (SEA's) are met together with the conditions of EIA RoD's, where applicable.

The CEMP should specify all potential environmental impacts, control measures, performance criteria, and mitigation strategies, together with relevant monitoring and reporting procedures.

Annexure 1 to these guidelines presents an example of a CEMP (only partially). It is not mandatory to use this format; however, it may be used as a guide and demonstrates the type of issues that may need to be addressed on a specific project. Some guidance on the key environmental issues to be addressed can be found in Fig 1.5. In addition, any contingency plans for unforeseen circumstances or impacts that may arise needs to be included in the CEMP. The CEMP is a dynamic document, which may be subject to change or modifications as a result of site developments or changes on site.

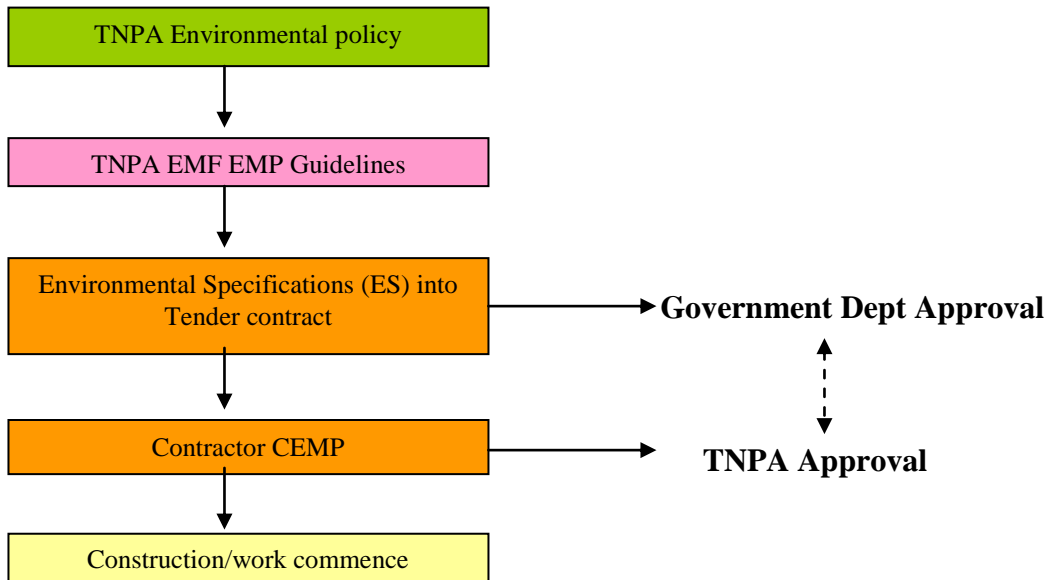


Fig 1.3 TNPA CEMP approval tree for construction and development activities which are initiated by TNPA.

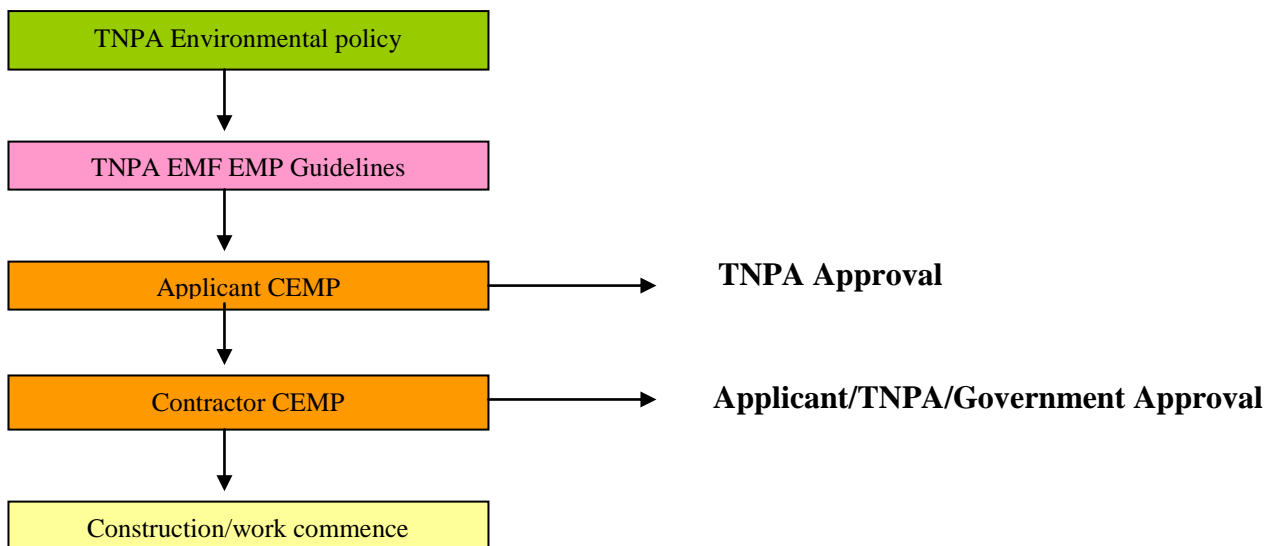


Fig 1.4 TNPA CEMP approval tree for construction activities based on application or proposal from an external client or tenant.

4.3 Implementation

No construction activities can commence on port property until a CEMP has been accepted in writing by TNPA. Furthermore, no work can commence on the site until the “pre start site inspection” has been held on site or appropriate agreement has been reached with the Port’s environmental staff. Ideally, a CEMP will be submitted with the development application; however, where contractors have not been appointed at the time of making the development application, the requirement for an CEMP will be an condition of approval, which will require the document to be lodged at least one week prior to the planned construction commencement date.

4.4 Structure of the CEMP

The following sections detail the various components of the CEMP. The level of detail required is, however, dependent on the size and nature of the development, and the sensitivity of the surrounding environment.

4.5 Introduction

This should include an overview of proposed works, the scope of the development and the layout of the works site, including size and location. It should contain site-specific details, such as:

- The address and real property description of the site;
- Details of the developer/contractors, and key groups or individuals who may be associated with the project; and
- Details of the type and duration of the construction phase.

Table 1: A summary of key environmental issues associated with the works at the site should be presented.

Key Environmental Issues	
➤ METHOD STATEMENTS	➤ Materials use, handling, storage and transport
➤ GENERAL SITE PROCEDURES	➤ Emergency procedures
➤ Demarcation of Environmentally Sensitive Areas	➤ Social issues
➤ Location of camp and depot	➤ SITE CLEARANCE
➤ Demarcation of the site	➤ Removal of endemic and endangered species
➤ Access and traffic control	➤ Removal of top soil
➤ Toilets	➤ Stabilisation of steep slopes
➤ Domestic waste water	➤ Removal of alien vegetation
➤ Refuse	➤ SITE REHABILITATION
➤ Dredging	➤ Scoping
➤ Protection of the fauna and flora	➤ Landscaping and preparation for revegetation
➤ Defacement of natural features	➤ Seeding
➤ Protection of archaeological and paleontological sites	➤ MANAGEMENT AND MONITORING:
➤ Effluent and storm water management	➤ General inspection and monitoring
➤ Seawater turbidity levels	➤ Scientific monitoring
➤ Dust control	➤ Environmental awareness training/inductions
➤ Noise control	➤ Documentation
➤ Underwater (and other) blasting	➤ Incentives and penalties
	➤ External audit
	➤ MEASUREMENT AND PAYMENT

The role of this section is to identify those areas, issues or values that may be impacted by the development. Risk assessment methodologies can be used to assess the potential environmental impacts, and prioritize preventative and remedial management strategies or actions.

Summary of Key Environmental Issues

A summary of key environmental issues associated with the works at the site should be presented (Table 1). Issues to be covered may include:

- Erosion and sediment control (including wind and water erosion, depending on the environment)
- Acid sulfate soil management
- Water-quality management
- Waste management
- Air-quality management (dust and vehicle emissions)
- Historical or cultural heritage
- Noise management
- Flora and fauna
- Land contamination

The role of this section is to identify those areas, issues or values that may be impacted by the development. Risk assessment methodologies can be used to assess the potential environmental impacts, and prioritise preventative and remedial management strategies or actions. The erosion and sediment-control management plan should also pay attention to the management of existing gully inlets downstream of the construction site.

4.5.1 Management responsibilities

This section should outline tasks associated with the development and implementation of the CEMP, and nominate the responsible staff members. It may include the roles and responsibilities of the following people:

- Project Manager
- Site Supervisor
- Project Engineer
- Site Foreman
- Site SHE Officer/Manager
- Employees (and sub-contractors)

4.5.2 Monitoring & Reporting

This section outlines the key elements to be monitored and reported over the duration of the project, including the maintenance period. These may include Environmental Audits, Environmental complaints and corrective action reports and register, and scheduled inspections by TNPA and government officials.

The CEMP is to acknowledge that a “*pre-start inspection*” meeting is to be held – to ensure the approved CEMP, including the specified environmental controls for the site, is understood by all parties (contractors/developers/TNPA etc). Additionally, the TNPA may also conduct audits throughout the construction phase as follows:

- “*project half complete inspection*” – to ensure work is being carried out in accordance with the approved CEMP;

- “*pre-completion inspection*” – to ensure all parties are clear on what will occur in the final stages of the construction work and what environmental issues are to be addressed; and
- “*project completion inspection*” – to ensure work has been completed in accordance with the approved CEMP and that no other matters require further work.

TNPA staff may also conduct spot inspections at any time during the project.

4.5.3 Key Management Plans

For each issue identified, key management plans should be prepared. These can be presented in tabular format (refer **Annexure 1**), which outlines:

- The management requirement;
- The action required to address the management requirement;
- The responsible person undertaking the action
- The timing for completing the action.

The CEMP provides the framework for managing environmental issues on the site during the construction phase. TNPA actively monitors (audits) the performance of the CEMP through site inspections and detailed environmental audits. The CEMP therefore forms part of the contract obligation since the EMP Guidelines and ES will accompany the tender and contract documentation.

4.5.4 Site Plan

A site plan must be attached to the CEMP. The plan should detail the spatial location of any proposed key developments on the site (building structure etc.), natural features (waterways, sensitive vegetation etc.), and any environmental control measures, eg. erosion controls. A copy of this plan should be displayed at the site office at all times, and be updated and amended as works progress.

5. Operating EMP's

5.1 Introduction

An Operational EMP (OEMP) is focused on sound environmental management practices, which will be undertaken to minimize adverse impacts on the environment through normal operation of the facility. In addition, an OEMP identifies what measures will be put in place or will be required to manage any incidents and emergencies that may occur during the operation of the facility.

All activities undertaken on Port property require an OEMP's as part of the TNPA lease agreement. The OEMP will be assessed as part of the lease adjudication process and forms a integral part of the lease agreements to be undersigned between TNPA and tenants of the Ports. Where the development involves an Environmental Impact Assessment (EIA) and approval of the OEMP might be undertaken National or Provincial government departments of Environmental Affairs and Tourism (DEAT).

An OEMP can also form the basis for an Environmental Management System (EMS) to be implemented both if development is to be undertaken with a construction phase before operations as well as when within existing infrastructure. TNPA encourages the implementation of an EMS based on the principles of the ISO 14001 international standards. A broad overview and implementation schedule needs to be provided in advance.

5.2 Mandatory Information

All information listed below is mandatory for an OEMP. If the OEMP forms part of a development application, most of the information below will be included in any case. Note that the 'applicant' will typically be the entity undertaking construction or the entity undertaking the activity on site once it has been constructed. All 'applicants' will also not necessarily be developing on port land but may also utilize existing infrastructure, in this case an OEMP and EMS outline must still be submitted in the prescribed format.

Information that must be provided about the proposal and associated OEMP includes:

- A real property description of the subject land;
- The postal address of the subject site (where possible);
- Full name and postal address of the applicant;
- The applicant's company name where applicable);
- Details of the activities that are to be undertaken and how activities will be managed;
- A scaled (dimensional) site plan (concept), including buildings, structures, drains and other site features relevant to the OEMP;
- Plans (concept) showing the proposed locations of all discharge and emission points to the environment, including where air, noise, liquids, dust, wastewater, smoke, vapours and any other contaminants are emitted; and
- Specific details and design of individual components/devices (such as dust/emission/odour extractors, waste water treatment facilities, etc).

Note that as much information as possible should be included in a plan. Using a plan clearly indicates the site-specific features as they are to be located on the site. A report should accompany the plans to complete the information required for review of the OEMP.

5.3 Detailed description of the proposed activity

It is essential that the applicant includes detailed description of the proposed activity in the OEMP, as it may form the basis for any licensing/permit conditions that may be requested by the organization or government departments, e.g. Dept of Environmental Affairs and Tourism (DEAT), Dept of Water Affairs & Forestry (DWAF), etc. The description to include information on:

- processes being undertaken and any emissions associated with the activity;
- plans of the site and surrounding area, and location of any discharge points;
- any nearby activities or environmental attributes that may be of relevance to the activity;
- an outline of the proposed operations and activities, including transport movements; and
- an assessment of risks and hazards, and measures to minimise these.

5.4 Details of any (actual & potential) emissions or other wastes and contaminants

This section is to provide details of the scale, intensity and regularity of actual and potential emissions expected as part of normal operations. Information that should be provided includes:

- quantity, regularity, concentration and description of actual and potential emissions and contaminants;
- the name and exact location of equipment giving rise to such discharges and emissions;
- the name and exact location of equipment used in the processing, reprocessing, treatment and/or discharge of wastes (on and off site);
- treatment, recycling and/or reprocessing either on or off site; and
- disposal and/or storage on or off site.

5.5 Site Environmental Induction

All personnel entering or working in the site must receive an induction covering all relevant environmental, safety, health and security issues. The extent of the induction should be based on the length of time for which the person will be on site, the activities that they will be undertaking and the risks to which they will be exposed. In particular, the induction must provide information on known environmental risks relating to site activities and site emergency plans. No person will be issued with Port access permits unless proof of induction is provided.

5.6 Environmental Complaints

An OEMP must address how any complaints relating to the operation are to be managed. An OEMP can include details of:

- The system for recording complaint details, including time, details of complainant, complaint specifics and follow up action;
- Investigation of environmental complaints;
- Notification of the relevant person or entity that complaints have been received; and
- Registration of complaints, including details of measures undertaken to satisfactorily address the complaint.

5.7 Environmental Incidents

An OEMP must detail how any environmental incidents are to be recorded and managed. Such detail must include:

- The requirement to immediately take appropriate action, such as the use of spill response kits;
- The process for informing the relevant persons and/or authorities (preferably in the Dept of Environmental Affairs and tourism prescribed manner.)
- The recording and investigation of all incidents as part of the OEMP;

- The reports prepared and circulated on the investigation; and
- Recommendations on steps to avoid similar events.

5.8 Monitoring

An OEMP must provide details of any program to be undertaken to monitor the environmental aspects and effects resulting from the operation on site. As part of the approval process, specific conditions may be placed on the applicant/operator to measure and monitor environmental performance. Monitoring may be the requirement of a specific license/permit, such as stormwater discharge, or based on a site-specific complaint, such as dust monitoring.

5.9 Auditing

The implementation of an OEMP must be monitored continually as indicated in 4.8 above. Periodic auditing by an external entity would be beneficial, and such aspects should also be detailed in the OEMP.

5.10 Responsibilities

Any OEMP must specify the individuals, positions/ or entities (together with contact details) responsible for all aspects of implementing the OEMP. In particular, the OEMP must clearly identify the individuals or otherwise responsible for:

- Receiving the reporting of monitoring, remedial action, environmental complaints and emergencies;
- Ensuring the measures/action plans are undertaken; and
- Verification, reporting and auditing of such measures/actions.

This should also include after-hours contact details for emergencies.

5.11 Supporting Information

There may be a requirement to undertake other studies or prepare other plans in support of an OEMP. These will typically be prepared for sites as part of a development proposal, but may be specifically prepared for a facility. These may include:

- a risk and hazard analysis with an action programme;
- an emergency response plan;
- a lighting plan;
- an acoustic report;
- a geotechnical report;
- a flora/fauna report; or
- details of consultation with relevant public authorities.

6. Decommissioning EMPs (DEMPs)

6.1 Introduction

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative usage and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include contamination of soil groundwater, stock that has been abandoned (e.g. oil drums, scrap equipment, old chemicals, etc) and old (unserviceable) structures. The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project. The decommissioning phase EMP's are typically encountered with storage before the ex/importing of minerals, base metals and other bulk commodities in Ports. As mentioned earlier in the document all three types of EMP' will be captured in the formal lease agreements with the latter only being required for approval on a agreed upon timeframe before vacation of land or infrastructure which should ideally be 2 years for long-medium term leases and 6 months for shorter term leases. This will enable decommissioning and rehabilitation to take place sufficiently and according to specified requirements.

6.2 Implementation

All EMP's (construction, operational and decommissioning) will be captured in the lease agreements to ensure commitment to the compliance to TNPA environmental requirements, legal requirements and the implementation of a environmental management system (formal or informal). CEMP and OEMP must be submitted for approval before commencement of work or occupation of land and infrastructure. The DEMP must be submitted before lease agreement lapses in order to undertake proper decommissioning and/or rehabilitation. In the case of long and medium term lease agreements the ideal timeframe would be two years before lease lapse and for short term lease agreements 6 months before lease lapse. Adherence to these requirements will be monitored by the Property Department/Business Unit and implementation overseen by the Environmental Department/Business Unit.

6.3 Auditing

TNPA will, where possible and necessary, conduct due diligence audits on newly acquired land as well as before land or a portion of land is leased to a tenant or operator. In most cases the tenants vacating the land will be required to conduct a due diligence audit to ascertain the environmental status of the land after their operational activities took place thereon. If TNPA is satisfied with the condition of the land then report can and will be communicated to the next tenant which will then act as his baseline status. If TNPA is not satisfied with the status of the land further rehabilitation and cleanup is to be undertaken by the vacating tenant. The due diligence audit will form the basis for all decommissioning and rehabilitation.

6.4 Key environmental issues to be addressed

All key issues identified and addressed in the CEMP and OEMP must be looked at and the residual effects and impacts addressed accordingly. The immediate and residual effects of the following substances and materials should also be looked at, if not mentioned in CEMP or OEMP:

- Air Emissions
- Waste and Wastewater Management
- Materials/Commodity Handling & Storage

- Solid Waste Management
- Hazardous Waste
- Radioactive Waste
- Asbestos Containing Materials (ACMs)
- Polychlorinated BI-Phenyls (PCBs)
- Ozone Depleting Substances
- Odor, Dust and Smoke Nuisances
- Soil and Groundwater

6.5 Rehabilitation plan

A rehabilitation plan should be submitted to TNPA for approval before rehabilitation commences. This rehabilitation plan must address all issues as per the OEMP as well as listed above but is not limited to that. TNPA will reply in writing to the applicant to continue with decommissioning and rehabilitation. This rehabilitation plans can and will also be sent to the Department of Water Affairs and Forestry since it's a legal requirement for all major rehabilitation plans to have their approval before commencement. Once again, only after written approval from DWAF can rehabilitation commence.

6.6 Key management plans

For each contaminant or area required rehabilitation identified, key management plans should be prepared accordingly. These can be presented in tabular format (refer **Annexure3**), which outlines:

- The management requirement;
- The action required to address the management requirement;
- The responsible person undertaking the action
- The timing for completing the action.

The DEMP provides the framework for managing the rehabilitation process on the site. TNPA actively monitors (audits) the performance and progress of the DEMP through site inspections and detailed environmental audits.

6.7 Monitoring

TNPA officials will continuously monitor the decommissioning and rehabilitation process to ensure compliance to plans and conditions provided or submitted.

6.8 Site plan

A site plan should be submitted to TNPA indicating the rehabilitation intentions, methods and contamination levels on. This site map will be used during monitoring.

Annexure 1

Examples of Construction and Operational Environmental Management Plan element tables. These tables represent examples of how to address environmental aspects, as per Table 1 (**Key Environmental Issues**).

Element 1: Noise Management (construction phase) Example only

It is acknowledged that, during the construction phase of a development, there is the potential for some generation of noise from on-site activities. The table below outlines the proposed management strategy to address issues relating to noise management that will be fully implemented prior to and during the construction phase of the development.

Table A – CEMP: Noise Management

ELEMENT	NOISE MANAGEMENT		
Objective	To manage activities on site to reduce the impact on surrounding properties.		
	To comply with relevant legislation.		
Management Strategy	Noise to be managed primarily through administrative controls during the construction phase.		
		Responsibility	Timing
Actions	All construction activities to be restricted to between 08h00 -17h00 during week days only;	Site Manager	Throughout construction phase
	All equipment used during construction phase to be regularly maintained to ensure efficient operation; and		
	Noise dampening equipment to be used on equipment with excessive noise-generating characteristics.		
Performance indicators	Lack of complaints/requests for attention by community/TNPA officials/authorities	Site Manager	Throughout construction phase
Monitoring	Daily inspection of the work site to occur;	Site Manager	Throughout construction phase
	Service logs of equipment/machinery used on site to be monitored.		
Reporting	Any complaints or incidents to be reported immediately to the Site Manager, who should then record this in a logbook.	Site Manager	Throughout construction phase
Corrective action	Investigate cause of excessive noise;	Site Manager	Throughout construction phase
	Implement corrective measures prior to the recommencement of site works;		
	Possible rescheduling of noise generating activities to reduce noise annoyance.		
Interfaces	Individual contractors/sub-contractors EMP's must address and comply with any other TNPA EMP or controls which exist for the Ports.	Site Manager	Throughout construction phase

Element 2: Erosion and Sediment Management (CONSTRUCTION PHASE) Example only

It is acknowledged that, during the construction phase of the development, there is a potential for ground disturbance, traffic movements and on-site drainage, which may increase the rate of erosion and sediment export from the site, and therefore impact the surrounding environment. Accordingly, the table below outlines the proposed management strategy to address issues relating to erosion and sediment management, which will be fully implemented prior to and during the construction phase of the development.

Table B – CEMP: Erosion and Sediment Management Plan

ELEMENT		EROSION AND SEDIMENT CONTROL	
Objective	To manage activities that exacerbate erosion, and provide on-site controls that reduce erosion and contain any transported material within the subject site.		
Management Strategy	Implementation of engineering measures and a comprehensive management strategy.		
		Responsibility	Timing
Actions	Prior to the commencement of site works, an Erosion and Sediment Control Plan must be implemented. The following controls should included in the plan: <ul style="list-style-type: none">• Perimeter control measures (eg. sediment control fencing) prior to the commencement of works;• Run-off water diversion measures around site works, where practicable;• Measures to control the tracking of site material onto surrounding sites and roads (eg. crushed rock pads, vibration grids etc.), so as not to impede existing traffic flows;• Clearly marked stockpile areas with associated control measures;• Geofabric to be placed over field gullies and/or side entry pits during construction phase;• Straw bales to be placed to divert runoff from adjoining blocks around the site;• Clearly delineated 'no-go' movement areas;• Access and egress points to the site.	Site Manager	Prior to commencement of works and throughout construction phase
	The following measures must also be implemented during the construction phase: <ul style="list-style-type: none">• Landscaping work to commence as soon as practicable to reduce exposure time of exposed soil;• Exposed areas to be covered with mulch material to reduce impacts of rainfall on the site;• Existing outfalls from the site to be modified to limit concentration and velocity of site flows;	Site Manager	Throughout construction phase

	<ul style="list-style-type: none"> Dust control measures to be used where required. 		
Performance Indicators	<ul style="list-style-type: none"> Erosion and sediment movement should not exceed natural rates; Lack of complaints/requests for attention by PBC staff. 	Site Manager	Throughout construction phase
Monitoring	<ul style="list-style-type: none"> Daily visual inspections of the work site and engineering structures should occur and be logged in the CEMP log book. Inspect immediately after a significant rainfall event. 	Site Manager	Throughout construction phase
Reporting	<ul style="list-style-type: none"> Any erosion and/or sedimentation issues should be reported to the site manager immediately. The site manager should record such incidents in a log book and report on corrective actions taken before the recommencement of site works. 	Site Manager	Throughout construction phase
Corrective Actions	<ul style="list-style-type: none"> Investigate cause of incident; Restore control measures prior to the recommencement of site works. 	Site Manager	Throughout construction phase
Interfaces	<ul style="list-style-type: none"> Individual contractors'/subcontractors' EMPs must address and accord with any other EMP contained in this report. 	Site Manager	Throughout construction phase

Element 3: Waste Management (OPERATIONAL PHASE)

EXAMPLE ONLY

It is acknowledged that waste may be generated during the operational phase of the development. The table below details those actions required to properly manage this waste.

Table C – OEMP: Waste Management

ELEMENT: NOISE MANAGEMENT			
Objective			
<ul style="list-style-type: none"> ➤ To minimize the potential for environmental impact of wastes generated on the operational site. ➤ To comply with all approvals and or licenses issued to the site as well as the total Port. 			
Management Strategy			
To efficiently manage the subject site and activities that may lead to generation of wastes.			
		Responsibility	Timing
Actions	All waste material to be removed off site shall be contained on site prior to disposal, using appropriate storage containers.	Site/Terminal Manager	Throughout operational phase
	All waste materials from operational activities shall be regularly cleared off site and disposed of at an approved landfill site.		
	Maintain high level of housekeeping on the site, ensuring that all waste materials are handled correctly and not left at large.		
	Undertake staff training upon commencement of employment to ensure compliance.		
Performance indicators	No wastes evident on site except in designated areas and containers.	Site/Terminal Manager	Throughout operational phase
	Complaints from TNPA Official/Authorities		
Monitoring	Regular inspections of the site.	Site/Terminal Manager	Throughout operational phase
Reporting	Logs to be kept of regular inspections as well as disposal certificates to be kept in a register.	Site/Terminal Manager	Throughout operational phase
Corrective action	Where a non-conformance has occurred, a detailed report of the incident and the cause shall be prepared and kept.	Site/Terminal Manager	Throughout operational phase
	Control measures are to be rectified and/or replaced in the event of non-conformance.		
Interfaces	Individual site EMP's must address and comply with any other TNPA EMP or controls which exist for the Ports.	Site/Terminal Manager	Throughout operational phase

Element 4: Hydrocarbon Contamination Rehabilitation (decommissioning phase)

Example only

It is acknowledged that during the operational phase of an organization or business that there might be instances of pollution that has taken place on site or degradation of the quality of the land due to the nature of its activities. Therefore the affected areas have to be rehabilitated to its original state or to an acceptable level for TNPA and the authorities. The table below details how a typical action plan can be drawn up to depict the rehabilitation process.

Table D – DEMP: Hydrocarbon contamination Rehabilitation

ELEMENT	NOISE MANAGEMENT		
Objective	To reduce the levels of hydrocarbons in the contaminated soil to less than 1000ppm.		
	To comply with all conditions and requirements of the due diligence audit findings.		
Management Strategy	To efficiently rehabilitate the subject site to TNPA and legal requirements or to the condition the site was before operations.		
		Responsibility	Timing
Actions	All waste material to be removed off site shall be contained on site prior to disposal, using appropriate storage containers.	Site/Terminal Manager	
	All severely contaminated soil to be excavated approx 30cm deeper than contamination level and taken for remediation.		
	All areas that has medium to low contamination levels will be treated insitu with bioremediation products.		
Performance indicators	Acceptable hydrocarbon levels of less than 1000PPM	Site/Terminal Manager	
	Complaints from TNPA Official/Authorities		
Monitoring	Regular inspections of the site.	Site/Terminal Manager	
	All treated areas to be tested for hydrocarbon levels after completion of remediation works.		
Reporting	Logs to be kept of regular inspections as well as disposal certificates to be kept in a register.	Site/Terminal Manager	
Corrective action	Where hydrocarbon levels still exceed legislative levels a brief action plan with completion dates shall be prepared and kept.	Site/Terminal Manager	
	Control measures are to be rectified and/or replaced in the event of non-conformance.		
Interfaces	All DEMP's and rehabilitation plans must be approved by TNPA and in certain cases by the Authorities.	Site/Terminal Manager	