

**ENVIRONMENTAL MANAGEMENT PROGRAMME FOR MAINTENANCE WORK AT CHARL
MALAN QUAY, PORT OF PORT ELIZABETH**

Prepared for:

TRANSNET



Transnet National Ports Authority PLZ

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EXECUTIVE SUMMARY

Coastal and Environmental Services (Pty) Ltd was appointed by Transnet National Ports Authority (TNPA) to assist with the compilation of an Environmental Management Programme (EMPr) for the rehabilitation and maintenance work on the No.1 Quay (Charl Malan Quay). The quay requires rehabilitation over a 40m section of the quay on the south side, inside the harbour where the quay wall has been undermined by propeller wash from vessels using the harbour.

The Port Elizabeth Harbour is situated at the Southern end of Algoa Bay, which is one of the many half-heart Bays situated from Algoa Bay Westwards along the South Coast.

The proposed scope of engineering to repair the undermining of the quay in the Port of Port Elizabeth involves the implementation of a system of bidim lined, gabion baskets and tremie concrete to fill the void at the toe of the quay. In so doing, the intervention will also prevent any further undermining by sea vessel propeller wash.

Several activities that could potentially impact the environment during construction, maintenance and operation of the proposed quay rehabilitation were identified and are discussed in detail. These include but are not limited to noise and visual impacts, waste management and possible spillage of hazardous substances.

Environmental management specifications are recommended to address the various potential impacts described above. These environmental management specifications are to be adhered to for the effective management of environmental impacts.

All potential impacts identified can be mitigated to low significance if the environmental specifications identified in this report are adhered to. It is recommended that this EMPr be included in all contractual documents, so that the contractor may adequately prepare themselves in terms of resources to adhere to the environmental management specifications.

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1. INTRODUCTION

1.1 Background

Coastal and Environmental Services (Pty) Ltd was appointed by Transnet National Ports Authority (TNPA) to assist with the compilation of an Environmental Management Programme (EMPr) for the rehabilitation and maintenance work on the No.1 Quay (Charl Malan Quay) in the Port of Port Elizabeth. The quay requires rehabilitation over a 40m section of the quay on the south side within the Northern Basin of the harbour where the quay wall has been undermined by propeller wash from vessels using the harbour.

The EMPr will be submitted to the Competent Authority for approval in terms of the 2010 EIA Regulations, promulgated under the National Environmental Management Act (Act 107 of 1998, as amended). This is allowed for under activity 18 of GN. R 544, which states

“The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from the sea but excluding where such infilling, depositing, dredging, excavation, removal or moving;

(a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority”

The Applicant:

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CES has a proud record of developing and implementing environmental procedures as well as designing and auditing management systems, including ISO 14001 EMS. We also have a demonstrated ability to develop and implement Integrated Environmental Management Plans/Programmes (IEMP) with customised standard operating procedures for large and complex projects. Many of these environmental monitoring programmes have been rigorously reviewed by parties such as the World Bank, MIGA, European Investment Bank, IFC and the African

Development Bank which have confirmed our reputation for producing quality products. CES staff are all exceptionally well qualified with many being recognised experts in their particular discipline.

Specific port and harbour experience includes:

- Strategic Environmental Assessments (SEAs) for the ports of East London and Port Elizabeth and the scoping phase of the SEA for the Mossel Bay Port (2008)
- Climate change risk assessment for all South African ports (2009). This project involved a detailed assessment of direct and indirect climate change-related risks and appropriate mitigation and adaptation strategies for all of the ports.
- Environmental risk assessment of alternative bunkering modes. This project involved a detailed environmental risk assessment of alternative modes for bunkering of fuel in the Port Elizabeth Port and development of risk management guidelines.
- Environmental asset liability assessment for the Durban Port
- Integrated Waste Management Plan for the Mossel Bay Port (2008)
- Risk assessment for proposed coal terminal at the East London Port
- EIA for the Ngqura Port
- EIA for the East London Port's Reclamation Project
- EIA for the deepening of the East London Port
- Long-term rehabilitation plan for the Ngqura Port
- Environmental due diligence assessments for sites near Port Elizabeth
- Environmental assessment for the Luanda Bay Waterfront Development (Angola)
- Environmental pre-feasibility assessment for the upgrade of the Buchanan Port (Liberia)
- Integrated Environmental, Health and Safety Management Programme for the levelling works and dune rehabilitation at the Port Elizabeth Port

1.2 Description of construction activities

Subtech's approach to repair the undermining of the quay in the Port of Port Elizabeth involves the implementation of a system of bidim lined, gabion baskets and tremie concrete to fill the void at the toe of the quay. In so doing, the intervention will also prevent any further undermining by sea vessel propeller wash.

A bathymetric survey of the affected area will be conducted prior to the engineering work using multi-beam survey equipment off an 8m rigid hulled inflatable boat. The data will be used to calculate the exact amount of gabion baskets, each measuring 2 x 1 x 1 m, to be installed at the toe of the quay.

A level platform for installation of the gabions will be created by a dive team using a compressor and tremie pipe to airlift silt from the toe of the quay. Other debris that may be in the way of the gabions will also be removed.

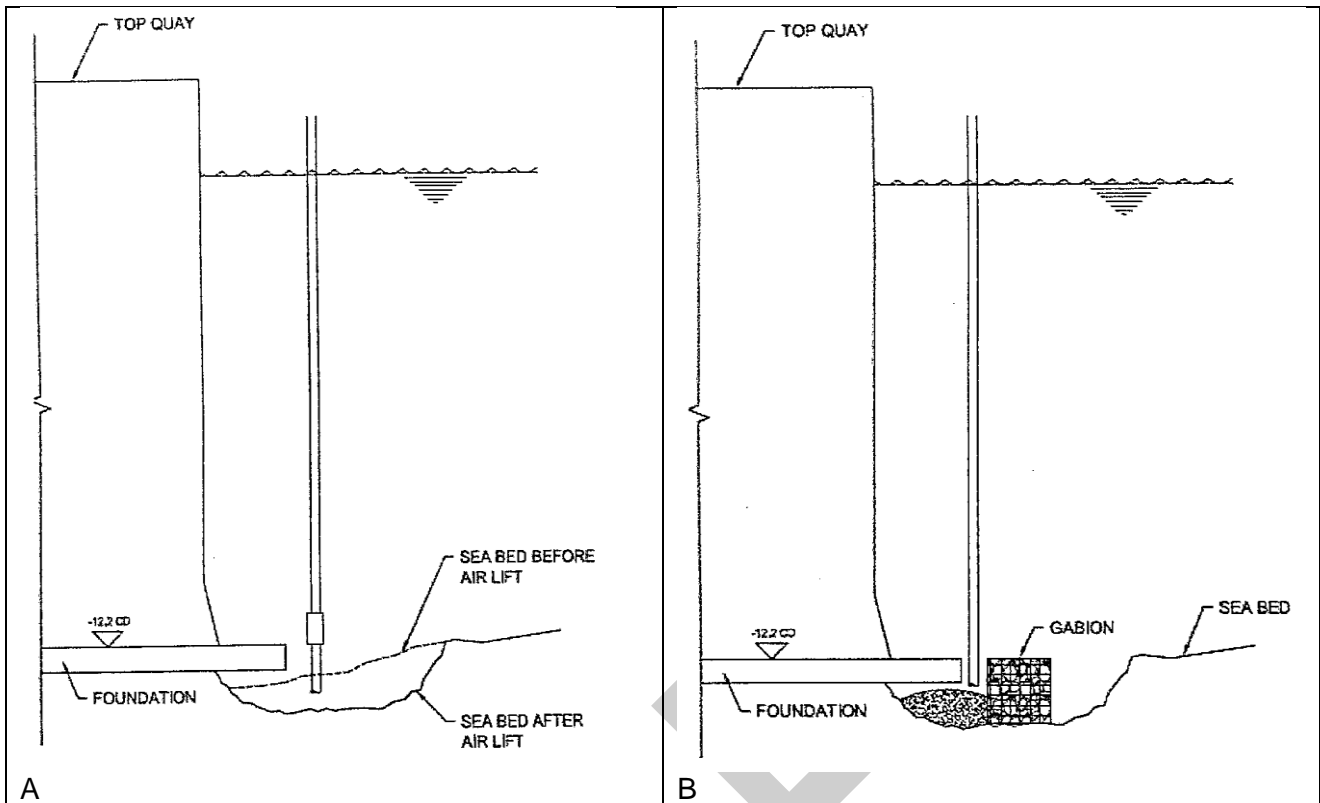


Figure 1. Diagrammatic representation of the proposed use of the tremie apparatus for A) air lifting debris out of the area to even it out for the laying of gabions and B) the infilling of the void between the quay toe and gabions with ready-mix concrete. (Diagrams from the method statement of Subtech Group for this specific operation)

The gabions that are installed at the toe of the quay will act as a casing structure for the concrete infill. Ready-mix concrete will be pumped into the void by a dive team using a tremie pipe until the entire cavity is sealed.

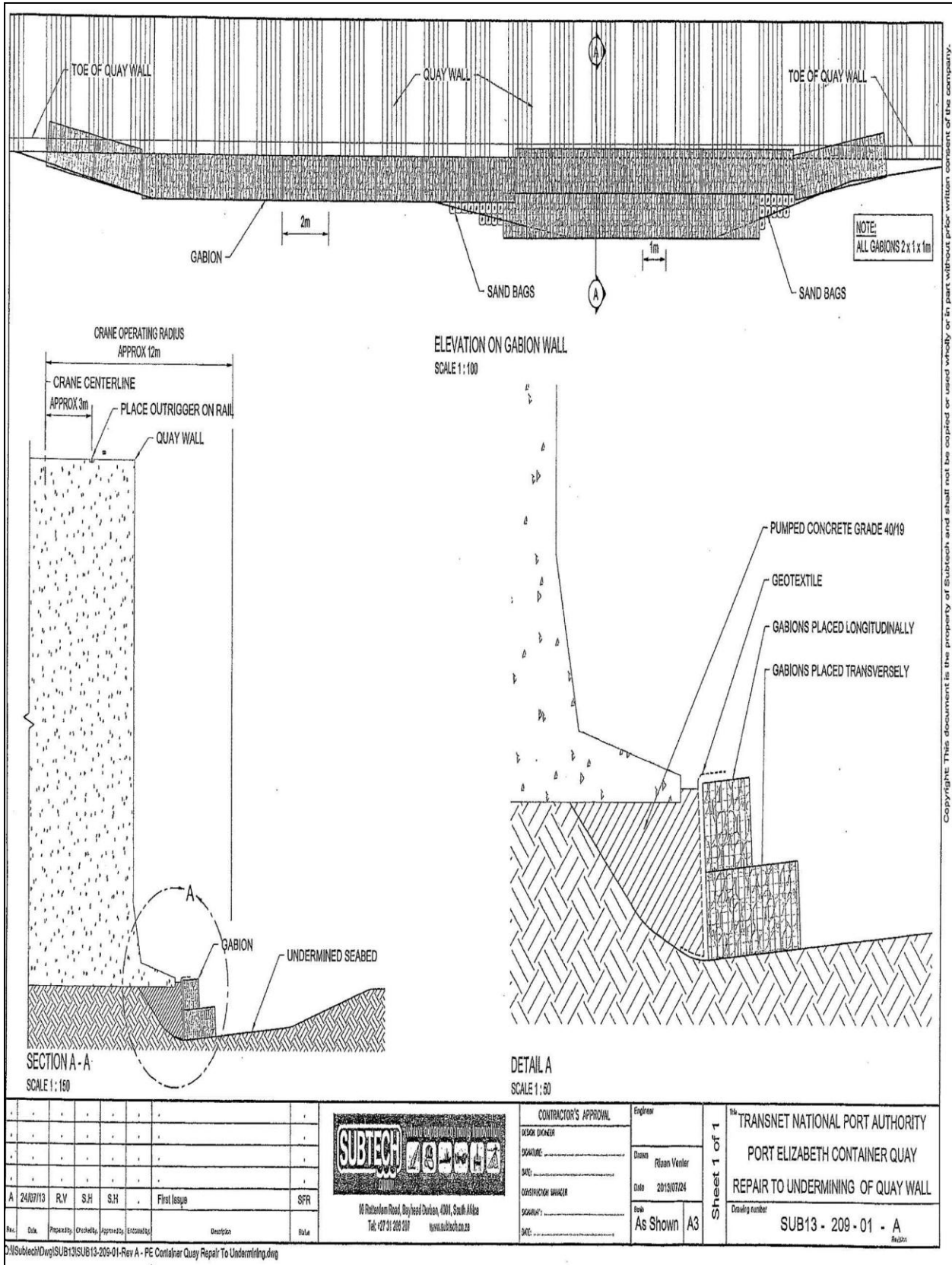


Figure 2. Diagrammatic representation of the proposed engineering works at the Charl Malan quay at the Port of Port Elizabeth. (Diagrams courtesy of the Subtech Group)

1.3 Location and description of the affected environment

The Port Elizabeth Harbour is situated at the southern end of Algoa Bay, which is one of the many half-heart bays situated from Algoa Bay westwards along the South Coast (Bremner, 1983). The

characteristic features of these bays are that a cape or promontory that occurs at the western or southern section of the bay forms the cusp of the heart and the bay curves in an arc to the north or east where another cape or promontory forms base of the heart. For Algoa Bay this is Cape Recife in the South and Woody Cape in the North East. These bays are also called log-spiral bays and the capes are composed of the resistant quartzites of the Cape Supergroup, which outcrop at Cape Recife. In Algoa Bay there are less resistant rocks, the Cretaceous sediments of the Uitenhage Group (Illgner, 2008).

The Charl Malan Quay was constructed in 1933 and is located at the top of the Northern Basin within the Port (

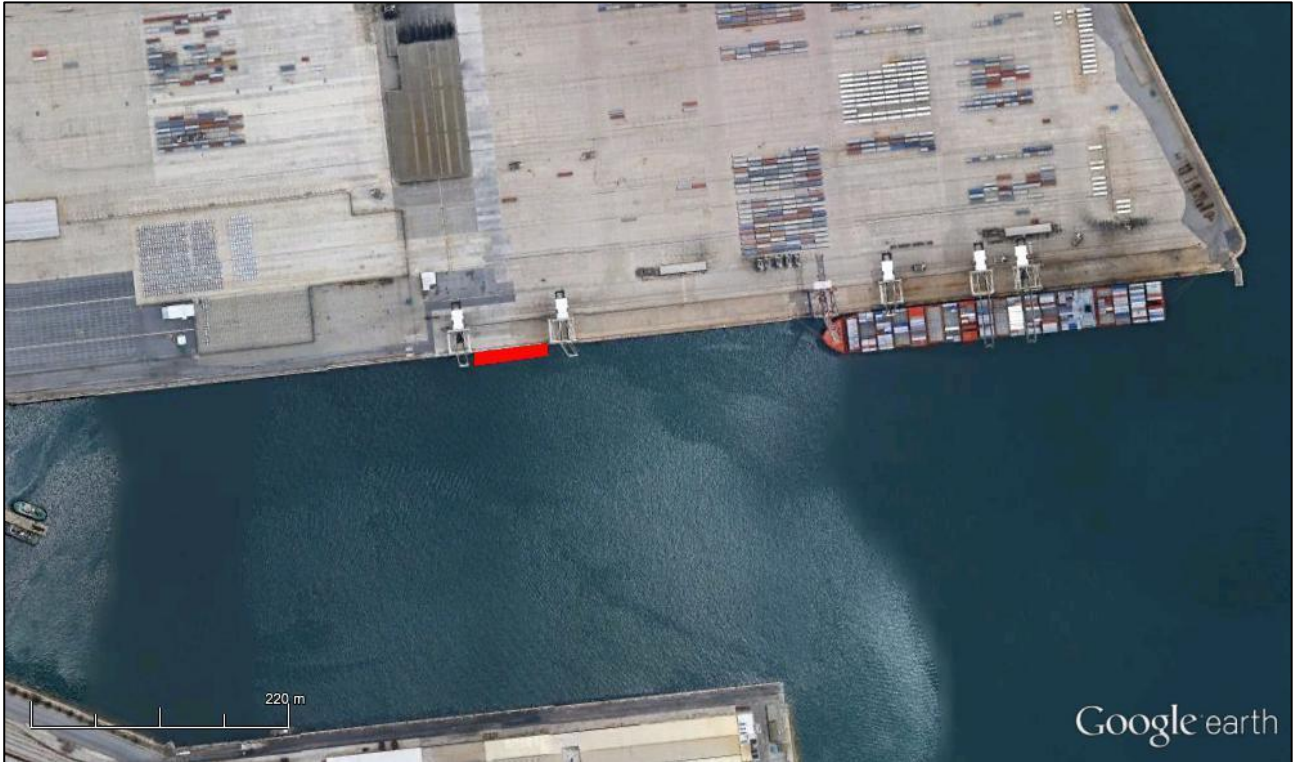


Figure 3). It is currently being used as the container and car terminal transition point for imports and exports. The container terminal has three berths totalling 925 m in length and a storage area of 22 hectares with 5400 ground slots for stacking purposes. The container terminal is equipped with the latest generation gantry container cranes and straddle carriers.

The quay structure is subject to regular propeller wash from vessel movements and the sediments within the Port are routinely disturbed through maintenance dredging of berthing area and navigation channels. The water quality of the port was described as a “mixed bag” by the 2013 summer monitoring report, which suggested that the Baakens River is introducing contaminants into the port and consequently impairing water quality (CSIR, 2013). Given the turbulent nature of the environment and fair condition of the water quality in the northern basin, it is not expected to find any species of special concern within the water of the affected area.

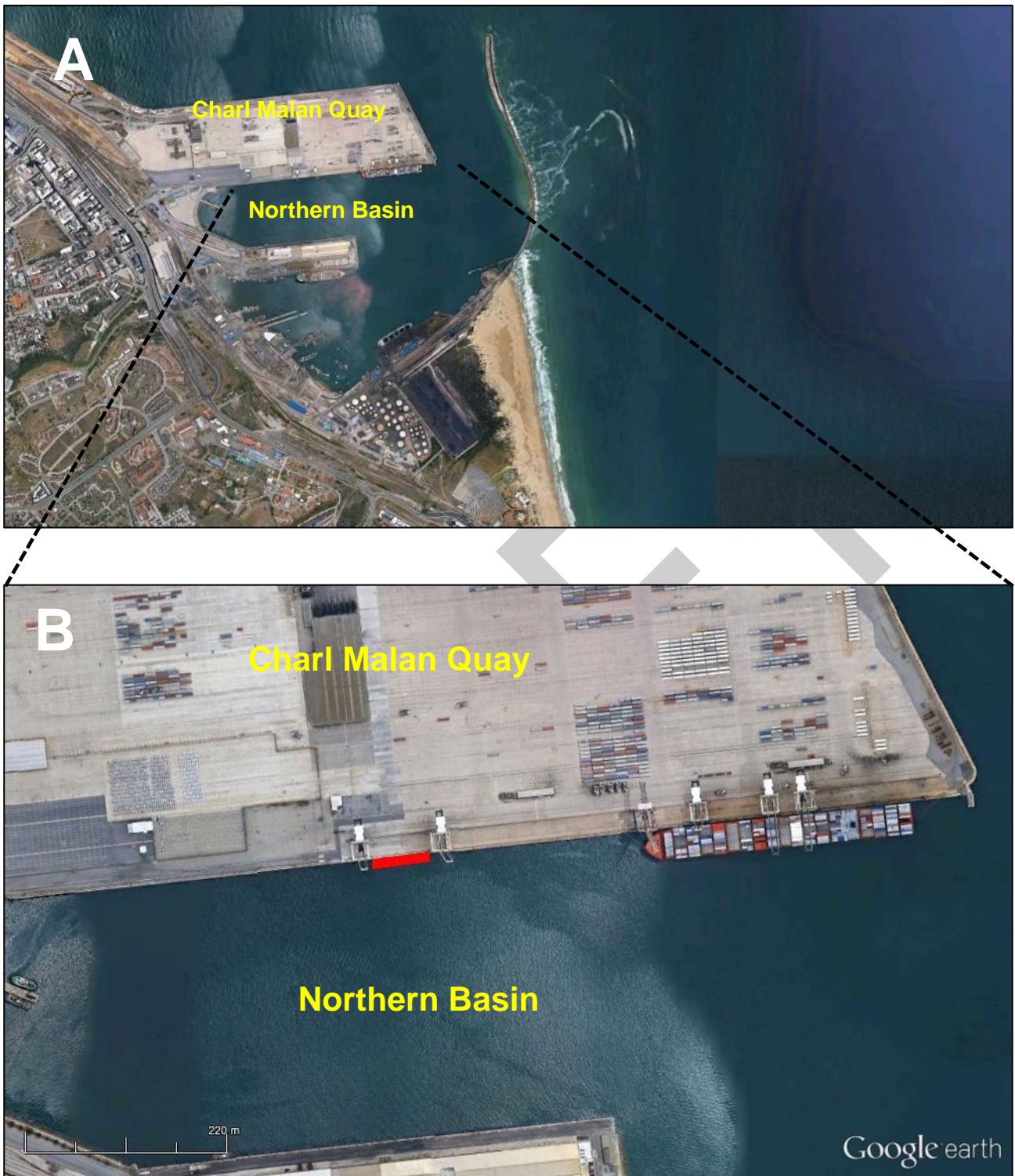


Figure 3: Site layout showing the Port of Port Elizabeth in A and the Charl Malan Quay in B where the works area is indicated by the red rectangle (Images courtesy of Google Earth)

While no specific biological studies have been conducted within the harbour itself, a long term monitoring programme is conducted within the harbour waters, and reports on the ecological status (including water quality) and sediment quality are generated bi-annually and annually respectively (CSIR, 2012 & 2013).

The heavy metal concentrations in water and sediments of the Port Elizabeth harbour, are low, but are also indicative of pollution from point sources in and around the harbour and from diffuse sources such as urban runoff. Most of the fair to poor water quality is attributed to inputs from the Baakens River which is not close to the area of interest for this development.

TNPA's February 2013 report card for water quality measurements shows that in the area of interest, the water quality was good for the parameters, pH, turbidity and dissolved oxygen concentration and fair for dissolved oxygen saturation.

Microbiological (*E. coli* and faecal streptococci), trace heavy metals and organic chemicals (BTEX, Polycyclic aromatic hydrocarbons, Total petroleum hydrocarbons) were also found to be at acceptable levels. The heavy trace metals measured included, arsenic, cadmium, copper, chromium, mercury, nickel, lead and zinc.

Sediment studies were conducted in the Port of Port Elizabeth in 2012 for the purpose of providing Transnet National Ports Authority with information for the completion of a permit application to the Department of Environmental Affairs to cover maintenance dredging in the port and the unconfined open water disposal of spoil for the next permit cycle. Impacts from dredging activity are much the same as those that are predicted for the current rehabilitation contract. The rehabilitation disturbances are expected to be on a much smaller scale though. The metals tested for included arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

The dredging maintenance study revealed that while there is definite metal contamination within the harbour, there appears to be little risk of the release of metals from sediment during the dredging and spoil disposal processes. This implies that little risk of the release of metals from sediment is expected during the quay wall rehabilitation activities (CSIR, 2012 & 2013).

2. ENVIRONMENTAL MANAGEMENT PROGRAMME

2.1 Purpose of an Environmental Management Programme (EMPr)

The preparation of an Environmental Management Programme (EMPr) is recognised as a tool in Integrated Environmental Management (IEM) to manage impacts on site. Typically an EMPr document is aligned to the project progress cycle addressing each project phase i.e. the Construction, Operation and Decommissioning phases. This EMPr deals exclusively with the management of impacts during the construction phase and its purpose is to:

- Outline the roles and responsibilities of the project managers; engineers; contractors; sub-contractors; the environmental control officer and the authorities;
- Provide a description of the methods and procedures for mitigating and monitoring impacts (Environmental Management Specification);
- Outline the EMPr audit procedure; and
- Describe penalties for non-compliance.

2.2 Glossary of terms, definitions and abbreviations

The following terms, definitions and abbreviations have been used in this EMPr:

Construction Activity	A construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process.
Contractor	The main company appointed by the Proponent, through the Project Manager, to undertake construction activities on the site.
DEA	Department of Environmental Affairs
Proponent	Transnet National Ports Authority (TNPA)
ECO	Environmental Control Officer The ECO monitors compliance with the EMPr during the construction phase and advises the Project Manager on environmental matters relating to construction.
EMPr	Environmental Management Programme The EMPr for the project sets out general instructions that will be included in a contract document for the construction phase of the project. The EMPr will ensure the construction activities are conducted and managed in an environmentally sound and responsible manner. The EMPr also details the organisational structure required to ensure the effective implementation of the EMPr and measures to monitor and improve the application of the EMPr.
EMS	Environmental Management Specifications - Provides a description of the methods and procedures for mitigating and monitoring impacts during the construction phase.
Environment	Means the surroundings within which humans exist and is made up of: The land, water and atmosphere of the earth; Micro-organisms, plant and animal life; Any part or combination of a) and b) and the interrelationships among and between them; and The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being
TNPA	Transnet National Ports Authority (the proponent)
Operational	The operational phase refers to the stage of the project life

phase	cycle in which the facility is fully operational or in use.
Project	This refers to all engineering and construction work to be conducted at Port of Port Elizabeth to improve public access.
Project Manager (PM)	The person responsible for overall management of the construction phase of the project including the management of all contractors.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area, feature or structure to a state that approximates to the state (where possible) that it was before disruption, or to an improved state.
Social environment	In this context the social environment would refer to any persons and human activities associated with the immediate environment.
Solid Waste	Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Water body	Any open body of water including streams, dams, rivers, lakes and the sea.

2.3 EMPr objectives and relevant legislation.

2.3.1 Objectives of an EMPr

The EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be done during the rehabilitation of the quay wall as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The purpose of the EMPr is to provide specifications for "good environmental practice" for application during construction.

This EMPr informs all relevant parties [the Project Coordinator, the Contractor, the Environmental Control Officer (ECO)] and all other staff employed by TNPA at the site as to their duties in the fulfilment of the legal requirements for the construction and maintenance of the quay wall with particular reference to the prevention and mitigation of anticipated potential environmental impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of an EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimize beneficial impacts;
- Create management structures that addresses the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all

phases of the activity;

- Ensure that safety recommendations are complied with;
- Specify time periods within which the measures contemplated in the final environmental management programme must be implemented, where appropriate;

2.3.2 Structure and function of an EMPr

An EMPr is focused on sound environmental management practices, which will be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies what measures will be in place or will be actioned to manage any incidents and emergencies that may occur during operation of the facility.

As such the EMPr provides specifications that must be adhered to, in order to minimise adverse environmental impacts associated with the operations of the Facility. The content of the EMPr is consistent with the requirements as set out in Regulation 33 of the 2010 EIA regulations stated below, for the construction phase and will be subject to the requirements of a number of laws as summarised in this Chapter.

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According to regulation 33 of GN R 543, an environmental management programme must include:

- (a) details of –
 - (i) the person who prepared the environmental management programme; and
 - (ii) the expertise of that person to prepare an environmental management programme;
- (b) information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
 - (i) planning and design;
 - (ii) pre-operations and operations activities;
 - (iii) operation or undertaking of the activity;
 - (iv) rehabilitation of the environment; and
 - (v) closure, where relevant.
- (c) A detailed description of the aspects of the activity that are covered by the draft environmental management programme;
- (d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);
- (e) Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;
- (f) As far as reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally acceptable principle of sustainable development, including, where appropriate, concurrent or progressive or progressive rehabilitation measures;
- (g) A description of the manner in which it intends to –
 - (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) remedy the cause of pollution or degradation and migration of pollutants;
 - (iii) comply with any prescribed environmental management standards or practices;
 - (iv) comply with any applicable provisions of the Act regarding closure where applicable; and
 - (v) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.
- (h) Time periods within which the measures contemplated in the draft environmental management programme must be implemented;
- (i) The process for managing any environmental damage, pollution and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;
- (j) An environmental awareness plan describing the manner in which –
 - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment;
- (k) Where appropriate, closure plans, including closure objectives

2.3.3 Relevant Legislation

TNPA must ensure that all South African legislation concerning the natural environment, pollution and the built environment is strictly enforced. Such legislation must include, but is not limited to the:

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
 Integrated Coastal Management Act (Act 24 of 2008)
 The Occupational Health & Safety Act (Act 85 of 1993)
 National Environmental Management Act (No 107 of 1998) (NEMA)
 National Environmental Management Biodiversity Act of 2004
 National Heritage Resources Act (Act 25 of 1999)

The Constitution of the Republic of South Africa

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed Alternatives, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:

- a) *To an environment that is not harmful to their health or well-being; and*
- b) *To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:*
 - (i) *Prevent pollution and ecological degradation;*
 - (ii) *Promote conservation; and*
 - (iii) *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

Relevance to the proposed Port of Port Elizabeth maintenance work:

- Obligation to ensure that the proposed work will not result in pollution and ecological degradation; and
- Obligation to ensure that the proposed work is ecologically sustainable, while promoting economic and social development.

The Integrated Coastal Management Act (ICM) (Act 24 of 2008)

This Act provides for the promotion of conservation efforts in the coastal environment, the promotion of sustainable use of natural resources and the prevention of pollution, among other outcomes.

Chapter 7 (Section 58) of the ICM provides for duty to avoid causing adverse effects on the coastal environment (should be read in conjunction with Section 28 of NEMA) while Chapter 8 (Section 69) addresses marine and coastal pollution control.

Relevance to the proposed Port of Port Elizabeth Quay maintenance work:

- Obligation to ensure that the proposed work will not result in degradation of the coastal environment; and
- Obligation to ensure that the proposed work will not result in pollution of the marine environment.

The National Environmental Management Act (NEMA) (107 of 1998), as amended.

The objective of NEMA is: *“To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.”*

A key aspect of NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. The proposed construction has been assessed in terms of possible conflicts or compliance with these principles. Section 2 of NEMA contains principles (see Box 1) relevant to the proposed project.

Box 1: NEMA Environmental Management Principles

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: <ul style="list-style-type: none"> i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed work should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA also provides regulations regarding the control of vehicles in the coastal zone, Published under Government Notice 1399 in *Government Gazette* 22960 of 21 December 2001 and amended by: GN R1426 (7 December 2004) and then GN R1012 amended 5 November 2010, with Regulation 4, describing permissible uses. Vehicles used in the construction activities for the unpinning of the quay do not require a permit, further to the content of Regulation 4 as outlined below:

Regulation 4: The following uses of vehicles within the coastal zone are permissible without a permit granted under regulation 6 -	
(a)	the use by any person of any vehicle - <ul style="list-style-type: none"> (i) on a public road; (ii) on private land by the owner or with the permission of the owner or lawful occupier of that land; (iii) on a road within a coastal protected area with the permission of the manager of that coastal protected area; (iv) for mining or associated purposes within a mining area as defined in <u>section 1</u> of the Minerals Act, 1991 (Act No. 50 of 1991); (v) within any part of a proclaimed Harbour that has already been physically modified to the extent that it is no longer in a natural or semi-natural state; (vi) in an emergency situation in order to safeguard human life or health, property or any aspect of the environment;

(d)	the use by an employee of any organ of state of any vehicle for the purposes of performing the public duties of that organ of state.
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NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons. Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

In addition, NEMA introduced a new framework for environmental impact assessments (as discussed previously) in 2006, which were amended in 2010.

Relevance to the proposed Port of Port Elizabeth maintenance work:

- Transnet National Ports Authority (Port of Port Elizabeth) must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.
- Transnet National Ports Authority (Port of Port Elizabeth) must be mindful of the principles, broad liability and implications of causing damage to the environment.

The National Environmental Management: Biodiversity Act (10 of 2004)

This Act provides for the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act 107 of 1998, as amended (see Box 2 below). In terms of the Biodiversity Act, TNPA has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations of 2010).
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

Box 2: Management and Conservation of South Africa’s Biodiversity within the Framework of NEMA

CHAPTER 4	
	Provides for the protection of species that are threatened or in need of national protection to ensure their survival in the wild; <ul style="list-style-type: none"> ○ to give effect to the Republic’s obligations under international agreements regulating international trade in specimens of endangered species; and ○ ensure that the commercial utilization of biodiversity is managed in an ecologically sustainable way.
CHAPTER 5 (Part 2)	
Section 73	A person who is the owner of land on which a listed invasive species occurs must: <ul style="list-style-type: none"> a) notify any relevant competent authority, in writing, of the listed invasive species occurring on that land; b) take steps to control and eradicate the listed invasive species and to prevent it from spreading; and c) take all required steps to prevent or minimise harm to biodiversity.
Section 75	<ul style="list-style-type: none"> • Control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in

	<p>which it occurs.</p> <ul style="list-style-type: none"> • Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment. • The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.
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The objectives of this Act are to provide, within the framework of the National Environmental Management Act, for:

- The management and conservation of biological diversity within the Republic;
- The use of indigenous biological resources in a sustainable manner.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations, which were promulgated in February 2007.

<p><u>Relevance to the proposed Port of Port Elizabeth maintenance work:</u></p> <ul style="list-style-type: none"> • The proposed work must conserve endangered ecosystems and protect and promote biodiversity; • Must assess the impacts of the proposed work on endangered ecosystems; • No protected species may be removed or damaged without a permit.

Occupational Health and Safety Act Amendment Act, No. 85 of 1993

The objective of this Act is to provide for the health and safety of persons at work (See Box 3 below). In addition, the Act requires that, *“as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards”* (Glazewski, 2005: 575). The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed work.

<p><u>Relevance to the proposed Port of Port Elizabeth maintenance work:</u></p> <ul style="list-style-type: none"> • Transnet National Ports Authority (Port of Port Elizabeth) must be mindful of the principles and broad liability and implications contained in the OHS Act and mitigate any potential impacts. • It is advised that The Occupational Health & Safety Act must be displayed in a convenient location at the workplace. All hazards are to be identified and adequate risk measures are to be put into place which will reduce their risk. Any incidents which occur on the Project site are to be recorded and reported in the manner as described in the Act.
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Box 3: Health and Safety of Persons at Work According to the Occupational Health and Safety Act

8: GENERAL DUTIES OF THE EMPLOYERS TO THEIR EMPLOYEES	
(1)	Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.
(2)	Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular- <ul style="list-style-type: none"> a) The provision and maintenance of systems of work, plant and machinery that, as far as is

	<p>reasonably practicable, are safe and without risks to health;</p> <p>b) Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment;</p> <p>d) Establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;</p> <p>e) Providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees;</p> <p>f) As far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken;</p> <p>g) Taking all necessary measures to ensure that the requirements of this Act are complied with by every person in his employment or on premises under his control where plant or machinery is used;</p> <p>h) Enforcing such measures as may be necessary in the interest of health and safety;</p> <p>i) Ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and authority as contemplated in Section 37 (1) (b).</p>
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13: DUTIES OF EMPLOYERS TO INFORM

Every employer shall:

(a)	As far as is reasonably practicable, cause every employee to be made acquainted with the hazards to his health and safety attached to any work which he has to perform, any article or substance which he has to produce, process, use, handle, store or transport and any plant or machinery which he is required or permitted to use, as well as with the precautionary measures which should be taken and observed with respect to those hazards;
(b)	Inform the health and safety representatives concerned beforehand of inspections, investigations or formal inquiries of which he has been notified by an inspector, and of any application for exemption made by him in terms of section 40; and
(c)	Inform a health and safety representative as soon as reasonably practicable of the occurrence of an incident in the workplace or section of the workplace for which such representative has been designated.

14: GENERAL DUTIES OF EMPLOYEES AT WORK

Every employee shall at work:-

(a)	Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions;
(b)	As regards any duty or requirement imposed on his employer or any other person by this Act, cooperate with such employer or person to enable that duty or requirement to be performed or complied with;
(c)	Carry out any lawful order given to him, and obey the health and safety rules and procedures laid down by his employer or by anyone authorized thereto by his employer, in the interest of health or safety;
(d)	If any situation which is unsafe or unhealthy comes to his attention, as soon as practicable report such situation to his employer or to the health and safety representative for his workplace or section thereof, as the case may be, who shall report it to the employer; and
(e)	If he is involved in any incident which may affect his health or which has caused an injury to himself, report such incident to his employer or to anyone authorized thereto by the employer, or to his health and safety representative, as soon as practicable but not later than the end of the particular shift during

	which the incident occurred, unless the circumstances were such that the reporting of the incident was not possible, in which case he shall report the incident as soon as practicable thereafter.
15: DUTY NOT TO INTERFERE WITH, DAMAGE OR MISUSE THINGS [S. 15 substituted by S. 3 of Act No. 181 of 1993.]	
	No person shall intentionally or recklessly interfere with, damage or misuse anything which is provided in the interest of health or safety.
18: FUNCTIONS OF HEALTH AND SAFETY REPRESENTATIVES.-	
(1)	A health and safety representative may perform the following functions in respect of the workplace or section of the workplace for which he has been designated, namely (a) review the effectiveness of health and safety measures; (b) identify potential hazards and potential major incidents at the workplace; (c) in collaboration with his employer, examine the causes of incidents at the workplace; (d) investigate complaints by any employee relating to that employee's health or safety at work; (e) make representations to the employer or a health and safety committee on matters arising from paragraphs (a), (b), (c) or (d), or where such representations are unsuccessful, to an inspector; (f) make representations to the employer on general matters affecting the health or safety of the employees at the workplace; (g) inspect the workplace, including any article, substance, plant, machinery or health and safety equipment at that workplace with a view to, the health and safety of employees, at such intervals as may be agreed upon with the employer: Provided that the health and safety representative shall give reasonable notice of his intention to carry out such an inspection to the employer, who may be present during the inspection; (h) participate in consultations with inspectors at the workplace and accompany inspectors on inspections of the workplace; (i) receive information from inspectors as contemplated in section 36; and (j) in his capacity as a health and safety representative attend meetings of the health and safety committee of which he is a member, in connection with any of the above functions.
(2)	A health and safety representative shall, in respect of the workplace or section of the workplace for which he has been designated be entitled –to (a) visit the site of an incident at all reasonable times and attend any inspection in loco; (b) attend any investigation or formal inquiry held in terms of this Act; (c) in so far as it is reasonably necessary for performing his functions, inspect any document which the employer is required to keep in terms of this Act; (d) accompany an inspector on any inspection; (e) with the approval of the employer (which approval shall not be unreasonably withheld), be accompanied by a technical adviser, on any inspection; and (f) participate in any internal health or safety audit.
(3)	An employer shall provide such facilities, assistance and training as a health and safety representative may reasonably require and as have been agreed upon for the carrying out of his functions.
19: HEALTH AND SAFETY COMMITTEES.-	
(4)	A health and safety committee shall hold meetings as often as may be necessary, but at least once every three months, at a time and place determined by the committee:
24: REPORT TO INSPECTOR REGARDING CERTAIN INCIDENTS.-	
(1)	Each incident occurring at work or arising out of or in connection with the activities of persons at work, or in connection with the use of plant or machinery, in which, or in consequence of which- (a) any person dies, becomes unconscious, suffers the loss of a limb or part of a limb or is otherwise injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or to continue with the activity for which he was employed or is usually employed; (b) a major incident occurred; or (c) the health or safety of any person was endangered and where (i) a dangerous substance was spilled; (ii) the uncontrolled release of any substance under pressure took place;

	(iii) machinery or any part thereof fractured or failed resulting in flying, falling or uncontrolled moving objects; or (iv) machinery ran out of control, shall, within the prescribed period and in the prescribed manner, be reported to an inspector by the employer or the user of the plant or machinery concerned, as the case may be.
(2)	In the event of an incident in which a person died, or was injured to such an extent that he is likely to die, or suffered the loss of a limb or part of a limb, no person shall without the consent of an inspector disturb the site at which the incident occurred or remove any article or substance involved in the incident therefrom: Provided that such action may be taken as is necessary to prevent a further incident, to remove the injured or dead, or to rescue persons from danger.
26: VICTIMIZATION FORBIDDEN.-	
(2)	No employer shall unfairly dismiss an employee, or reduce the rate of his remuneration, or alter the terms or conditions of his employment to terms or conditions less favourable to him, or alter his position relative to other employees employed by that employer to his disadvantage, by reason of the information that the employer has obtained regarding the results contemplated in section 12 (2) or by reason of a report made to the employer in terms of section 25.

National Heritage Resources Act (NHRA) (Act 25 of 1999)

According to the preamble contained within the NHRA, “This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations”

Section 34 (1) of the Act states, (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority”

Where “structure” is defined under the Act as "any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith"

And “alter” is defined as “any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means”.

Clarification is currently being sought from the South African Heritage Resources Agency (SAHRA) as to whether the envisioned works (according to the Subtech method statement) constitute “alteration”.

Potential relevance to the proposed Port of Port Elizabeth maintenance work:

- The Charl Malan Quay is an 80 year old structure which makes it, according to the National Heritage Resources Act (Act 25 of 1999) (NHRA), a structure of national heritage and cultural significance. In areas where there has not yet been a systematic survey to identify heritage resources and provide them with formal protection, a permit is required from the provincial heritage resources authorities to alter or demolish any structure older than 60 years.

3. ENVIRONMENTAL IMPACT STATEMENT

3.1 Key activities posing environmental impact risk

The activities that are undertaken during construction, maintenance and operation of the proposed quay rehabilitation and that could potentially have an impact on the environment are listed below:

- Disruption of port activities during the rehabilitation of the quay wall;
- Use of available roads and tracks for transportation of equipment materials and for construction site access;
- Use of transportation and construction vehicles and equipment;
- Setting up of a construction camp site at and/or close to the proposed site;
- Noisy construction activities;
- Refuelling and maintenance of construction vehicles and plants;
- Establishment and use of concrete dispersion equipment;
- Resourcing, introduction, storage and use of construction material such as water, concrete, brick, fuel, oils, steel structures, equipment, construction wastes and litter;
- Use of hazardous substances such as fuels, oils, paints, solvents, etc.;
- Possible use of portable ablution facilities;
- Disposal of construction rubble;
- Waste management during construction;
- Safety issues during construction;
- Storm water management on the construction site which could result in the introduction of pollutants into the sea.

3.2 Impact assessment criteria

Several potential environmental impacts have been identified and are addressed in this chapter. Mitigation measures are also presented where impacts are predicted to have significant negative environmental impacts.

A standard rating scale has been defined by CES and will be used to assess and quantify the identified impacts. This methodology is detailed in Appendix 2.

3.3 Potential Environmental Impacts and Impact Tables

3.3.1 Impacts on marine ecology

Impacts on the environment may include noise, vibration and shock on the marine ecology within the harbour due to construction activities.

The duration and severity of the engineering activities are of low magnitude and over a short period. The ecology of the harbour wall is also not expected to be unique in composition and diversity; hence any disturbance over the 40m area is not expected to have any significant environmental impacts in terms of marine ecology in the project area.

Mitigation

Due to the nature of the work and the underwater environment, mitigation is very difficult. However, the impact can be reduced to negligible by divers preparing the sea bed for placement of the gabions only disturbing the sediment necessary to create a level foundation. Great care must also be exercised by the tremie pipe operator not to discharge concrete in non-target areas.

Significance statement

Impact	Effect			Risk or Likelihood	Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Slight	May occur	LOW -
With mitigation	Short Term	Localised	Slight	May occur	LOW-

3.3.2 Visual impacts

Visual impact may include clouding or colouring of the surface water by the construction activities. The rehabilitation activities may cause clouding of the water as sediment and debris is kicked up from the operations. It is expected that this would be fairly localised however and of short duration.

Mitigation

Any fine material that is to be disposed of should be released in a controlled manner as close to the seabed as possible so as to minimise clouding effects at the surface.

Significance statement

Impact	Effect			Risk or Likelihood	Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Slight	Probable	MODERATE -
With mitigation	Short Term	Localised	Slight	May occur	LOW-

3.3.3 Water quality

- a) Development of anoxic conditions at the site due to low oxygen content.

The engineering activities are expected to kick up a bit of sediment, debris and benthic material that may cause anoxic conditions. Furthermore, contaminated sediments may be remobilised by the activities and be spread with limited control.

Mitigation

Dredging maintenance studies conducted in 2012 (CSIR) revealed that while there is definite metal contamination within the harbour, there appears to be little risk of the release of metals from sediment during dredging and spoil disposal processes.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Slight	Unlikely	LOW -
With mitigation	Short Term	Localised	Slight	Unlikely	LOW-

- b) Persistent Organic Pollutants (POPs) that may be present in excavated material may bio-accumulate.

Mitigation

It is unlikely that POPs may be present in the area of concern as this is an area of high disturbance. Any organic pollutants that could exist would be churned up by the propeller action of sea vessels on a daily basis.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Slight	Unlikely	LOW -
With mitigation	Short Term	Localised	Slight	Unlikely	LOW-

3.3.4 Impacts on biological components

Alteration of sediment composition may impact the biotic community, i.e. of substrate characteristics surrounding the disposal site, resulting in a change of the nature and diversity of benthic communities, e.g. decline of individual density, species abundances or biomass.

Mitigation

The ecology of the harbour wall is also not expected to be unique in composition and diversity, hence any disturbance over the 40m area is not expected to have any significant environmental impacts in terms of marine ecology. Furthermore, it is expected that the area in question will be recolonized within a relatively short period of time. Communication with CSIR dive team members who have conducted surveys in the harbour confirmed that there are no biological components of conservation significance.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Slight	Probable	LOW -
With mitigation	Short Term	Localised	Slight	Probable	LOW-

3.3.5 Public safety

Safety of other craft in and around the harbour is of concern during the construction activities. The extra ordinary harbour activities could possibly affect other users in the absence of caution.

Mitigation

Notice must be given to all users of the port a minimum of one week in advance of the commencement of construction. The contractor should erect signage informing all users of the port of the construction activities. A construction area and no-go zones should be clearly demarcated.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Severe	May Occur	MODERATE -

With mitigation	Short Term	Localised	Slight	Unlikely	LOW-
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3.3.6 Waste Management

- a) The proposed dredging may result in increased debris and refuse washing up on beaches.

Mitigation

It is highly unlikely that the activities in the harbour would affect nearby coast lines as the affected area is extremely small and confined to the port area only. The dredged material should be kept to a minimum i.e. only what is necessary for levelling of the surface for gabion placement, and disposed of at sites allowed by the existing dredging permit.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Moderate	May occur	MODERATE -
With mitigation	Short Term	Localised	Slight	Unlikely	LOW-

3.3.7 Pollution control

- a) Inadequate maintenance of machinery and equipment may lead to contamination of water and sediment.

Mitigation

All machinery and vehicles should be well maintained and inspected on regular bases to ensure that no leaks exist that may contaminate the environment. All leaks should be immediately reported to the project management and health and safety officer for immediate action.

Significance statement

Impact	Effect			Risk or Likelihood	Total Score
	Temporal Scale	Spatial Scale	Severity of Impact		
Construction phase					
Without mitigation	Short Term	Localised	Moderate	May occur	MODERATE-
With mitigation	Short Term	Localised	Slight	Unlikely	LOW-

- b) Lack of appropriate toilet facilities for construction workers may result in sewage contamination of the harbour.

Mitigation

Adequate ablution facilities should be available on site which negates the potential pollution effects that could occur from this source.

Significance statement

Impact	Effect	Risk or	Total Score
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	Temporal Scale	Spatial Scale	Severity of Impact	Likelihood	
Construction phase					
Without mitigation	Short Term	Localised	Moderate	May occur	MODERATE-
With mitigation	Short Term	Localised	Slight	Unlikely	LOW-

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4. ORGANISATION AND MANAGEMENT STRUCTURE

The following organizational and management structure is proposed for the repair works to the quay wall at the Port of Port Elizabeth.

4.1 Contractual obligation

In order to ensure that the EMPr and/or derivatives are enforced and implemented, these documents must be given some form of legal standing. This shall be achieved through incorporating the EMPr and/or derivative documents as an addendum to the contract documents for the particular project and specifying under particular conditions of the contract for the tender that the requirements of the EMPr and/or derivatives apply and must be met. This will ensure that the obligations are clearly communicated to contractors and that submitted tenders have taken into account, and budgeted for the environmental requirements specified in the EMPr and/or its derivatives. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMPr is legally binding.

4.2 The Proponent

Transnet National Ports Authority (TNPA) is the proponent and has overall responsibility for ensuring that the construction and development of the project is undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the EMPr and recommendations from the relevant authorities.

Role

TNPA will be required to assume overall responsibility for the environmental aspects of the construction and development of the project.

Responsibilities

The responsibilities of the proponent will include the following:

- Establish and maintain regular and proactive communications with the Project Manager, Contractor and ECO.
- Review and comment on environmental reports produced by the ECO.
- Ensure that the EMPr is reviewed and updated as necessary.

Reporting structure

The proponent will liaise with and/or take instruction from the following:

- The authorities,
- Other stakeholders,
- The general public.

4.3 Project Manager (PM)

TNPA will either design the infrastructure themselves or identify a suitably qualified officer from their staff to manage the project, or they will be appointing consulting engineers for the design and to act as the Project Manager (PM). The PM will ensure that the approved EMPr is included in the contract documentation issued to prospective contractors.

Role

The success of environmental compliance is determined to a large degree by the continual presence of the technically responsible party. Specific to the implementation of the EMPr, the role of the PM will be to:

- Oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications.

- Liaise between and with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

Responsibilities

The PM's responsibilities will include:

- Be familiar with the contents of the EMPr.
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports.
- Request for, review and approve the Method Statements prepared by the Contractor in consultation with the ECO.
- Issue site instructions giving effect to the ECO requirements where applicable.
- Review complaints received and make instructions as necessary.
- Maintain a record of complaints from the public and communicate these to the Contractor and the ECO.
- Discuss with the ECO the application of penalties for the infringement of the Environmental Management Specifications, and other possible enforcement measures when necessary.
- Issue penalties as and when necessary.
- Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred.
- Facilitate proactive communication between all role-players in the interests of effective environmental management.

Reporting structure

The Project Manager will report to the proponent, as and when required.

4.4 Environmental Control Officer (ECO)

An Environmental Control Officer (ECO) will monitor, review and verify the implementation of the EMPr. The ECO will be an on-going appointment for the duration of the construction process. The ECO must be independent from the Contractor, and must have appropriate authority to ensure that the EMPr is fully implemented and that appropriate actions are taken to address any discrepancies and non-compliances.

Role

The overall role of the ECO is to be the site 'custodian' for the implementation, integration and maintenance of the EMPr in accordance with the contractual requirements. The ECO will be required to liaise with the Project Manager on the level of compliance with the EMPr achieved by the Contractor on a regular basis for the duration of the contract.

Responsibilities

The ECO will have the following responsibilities, at a minimum:

- To advise the PM on the interpretation and enforcement of the Environmental Management Specifications (EMS) (Chapter 5), including discussions on non-compliances.
- To supply environmental information as and when required.
- To demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the PM concerning works in these areas.
- To monitor the Contractor's compliance with the EMS on a scheduled basis.
- To monitor any basic physical changes to the environment as a consequence of the construction works – e.g. evidence of erosion, murky waters, etc.
- Attend regular site meetings between the PM and contractor.
- To undertake regular weekly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM, the proponent, and the Competent Authority (DEA).

- To communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts.
- To advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities.
- Review and approve all areas that have been rehabilitated by the Contractor.
- Review complaints received and make instructions as necessary.
- Identify and make recommendations for minor amendments to the EMPr as and when appropriate.
- Ensure that the Contractor, his employees and/or Sub-Contractors receive the appropriate environmental awareness training prior to commencing activities.

Reporting structure

The ECO will report to the Project Manager and the DEA.

4.5 Contractor

The Proponent will appoint a Contractor to construct the development. The Contractor will be contractually required to undertake their activities in an environmentally responsible manner, as described in the EMPr.

Role

Specific to the EMPr, the role of the Contractor will be to:

- Implement, manage and maintain the EMPr for the duration of his contract.
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the EMPr.
- Assign appropriate authority, accountability and responsibility for these personnel to carry out their duties.
- Ensure that all sub-contractors and other workers appointed by the Contractor are aware of their environmental responsibilities while on site or during the provision of their services off site.
- Ensure that all sub-contractors and other workers appointed by the Contractor are complying with and implementing the EMPr during the duration of their specific contracts.
- Provide appropriate resources including budgets, equipment, personnel and training for the effective control and management of the environmental risks associated with the construction.

Responsibilities

The Contractor will have the following responsibilities:

- Be familiar with the contents of the EMPr.
- Comply with the EMS contained in the EMPr and subsequent revisions.
- Confirm legislative requirements for the construction works, and ensure that appropriate permissions and permits have been obtained before commencing activities.
- Prepare the programme of activities and drawings/plans for submission to the PM (and ECO).
- Review the site inspection reports and take cognisance of the information and implement recommendations contained therein.
- Notify the ECO and PM, verbally and in writing, immediately in the event of any accidental infringements of the EMS and ensure appropriate remedial action is taken.
- Notify the ECO and PM, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigating measures may be implemented timeously.

- Ensure environmental awareness among employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Management Specifications and the need for them.
- Maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract.
- Undertake the required works within the designated working areas.
- Rehabilitating services, utilities, private/public property and other areas adversely affected by construction activities outside of demarcated areas in accordance with the PM's instructions.
- Communicate and liaise frequently and openly with the PM and ECO to ensure effective, proactive environmental management with the overall objective of preventing or reducing negative environmental impacts while enhancing positive environmental impacts.

Reporting structure

The Contractor will receive instructions from the PM.

4.6 Sub-contractors

Role

The contractor may from time to time appoint Sub-Contractors to perform certain services and/or provide certain products in association with the construction and development of the project.

Responsibilities

Sub-Contractors shall comply with the Environmental Management Specifications in the EMPr and associated instructions issued by the Contractors to ensure compliance. Sub-contractors and their staff will be required to take part in the environmental awareness training as instructed by the main Contractor.

Reporting structure

Sub-Contractors will receive instructions from the main Contractors environmental specifications

The following section comprises a minimum range of constraints, controls, procedures and standards that are typically required for the construction activities associated with the proposed underpinning of the quay..

5. ENVIRONMENTAL MANAGEMENT SPECIFICATIONS (EMS) FOR THE CONSTRUCTION WORKS

The environment is considered to be composed of both biophysical and social components. Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment during the execution of a project to minimise the impact on affected parties. Minimisation of areas disturbed by construction activities (i.e. the 'footprint' of the construction area) should minimise many of the construction related environmental impacts and reduce rehabilitation requirements and costs. All relevant standards relating to international, national, provincial and local legislation, as applicable, should be adhered to. This includes requirements relating to waste emissions, waste disposal practices, noise regulations, etc. All relevant permits and permissions shall be obtained from the relevant authorities to undertake construction activities as necessary. Every effort should be made to minimise, reclaim and/or recycle 'waste' materials.

5.1 Planning

Compliance with environmental legislation

1. The Contractor shall ensure that all pertinent legislation concerning the protection of the natural environment and prevention of pollution is strictly enforced.
2. The ECO shall give guidance to the Contractor and the PM in respect of all legislation, regulations and guidance pertinent to the environmental management of the activities being undertaken.

Permits and permissions

1. The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and are strictly enforced/adhered to.
2. The Contractor shall maintain a database of all pertinent permits and permissions required for the contract as a whole and for pertinent activities for the duration of the contract.

Non-working times

1. No noisy construction works shall be executed except between sunrise and sunset on Monday to Saturday, inclusive, of any week, unless work is necessary for the saving of life or property or for the safety of the work.

Safety at the construction site

Extra safety precautions must be taken to ensure that visitors to the area do not come to harm.

1. The construction area and other potential construction-related danger areas must be clearly demarcated.
2. The construction site shall be off limits to the general public at all times during the construction period and site clean-up.
3. The Contractor shall ensure that hazard and warning signs are erected in the relevant languages at problem sites, and that they are maintained in good condition.
4. The Contractor must ensure that all staff is compliant with the relevant safety regulations on site and wears applicable safety clothing and gear at all times while on site.

Social disruption

1. The Contractor's employees shall in no way be a nuisance to other users of the Port of Port Elizabeth.
2. Any complaints received by the PM will be investigated, addressed and, if deemed necessary, the relevant persons will be suspended from the project.
3. The PM may request a representative of the Contractor to be available to discuss issues raised by port users make information available to them on construction activities.

Existing services and infrastructure

1. The Contractor and PM shall familiarise themselves with the position of existing services and infrastructure to ensure that existing services are not damaged or disrupted, unless required by the contract and with the permission of the PM.
2. The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services that are interrupted.
3. Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.
4. A time limit for the repairs may be stipulated by the PM in consultation with the Contractor.

Site division and contractor's camp

Given the small magnitude of the proposed construction works and the size of the construction footprint, the contractor's site camp shall be kept to a minimum. The site for the Contractor's Camp, if needed, shall be established on already disturbed ground and is subject to the approval of the PM and ECO. The site camp will be positioned such that it is effectively isolated from the surrounding environment and takes into consideration:

1. The risk of public nuisance through for example, noise generation, visual intrusion or disruption to access, is reduced.
2. Security implications are reduced.

Environmental training and awareness

1. The staff of the Contractor shall be made aware of the environmental requirements and constraints on construction activities contained in the provisions of the EMPr.

5.2 Site establishment

Site identification

1. The Contractor will produce a plan illustrating the proposed construction camp and proposed working and 'no-go' areas. The plan must be approved by the PM and ECO. The plan should include reference to the following aspects where pertinent as and where these are required:
 - Proposed working areas and boundaries.
 - 'No-go' areas.
 - Contractor's camp.
 - Sanitation/ablution facilities.
 - Storage, spoil, stockpile and lay down areas.
 - Batching plant and workshop/equipment maintenance areas, if needed.
 - Waste collection facilities.
 - Access routes.
2. The working areas shall be kept to a minimum to reduce the total physical footprint of the construction site and to reduce environmental damage.
3. The Contractor shall not use the land for the construction site for any purpose other than for the proper carrying out of the works under the contract.

Working areas and no-go areas

1. The construction site shall be divided into working areas and 'no-go' areas and the locations of these shall be marked clearly on appropriate plans for reference. No person, plant, equipment or material enters the no-go areas at any time
2. Where necessary, the 'no-go' areas shall be clearly demarcated using materials as specified by the PM. These may include fencing, rope, hazard tape, wire-mesh, or other approved materials or means.
3. The Contractor will be required to maintain all demarcation fencing and other demarcating materials for the duration of construction activities or as otherwise instructed by the PM.
4. In the event that any damage is caused to the 'no-go' areas, the Contractor will be required to repair, restore, reinstate and/or rehabilitate these areas to a standard required by the PM and ECO at the Contractor's cost.

5.3 Site Housekeeping

Site housekeeping

1. The construction site and surrounds are to be maintained in a clean orderly and presentable condition at all times.

Equipment maintenance and storage

1. All vehicles and equipment entering the construction site, contractor's site camp and/or immediate surrounding areas shall be kept in good working order, are to be serviced regularly and shall be stored, if necessary, in an area approved by the PM.
2. Leaking equipment shall be repaired immediately or removed from the site.
3. All washing of equipment and plant shall be undertaken in the off-site workshop.
4. On-site washing of plant and vehicles shall not be allowed.

Light pollution

1. Where the Contractor has been authorised to undertake night work, low glare lighting shall be used.
2. The lights used for construction should not interfere with normal port operations (eg. transmission of confusing signals).

Security

1. Where applicable, appropriate fencing, security gates, shelter, signage and/or security guards are to be provided at the construction site camp to ensure the security of all plant, equipment and materials, as well as to secure the safety of site staff.

General materials handling, use and storage

1. Materials shall be appropriately secured to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or supplier to properly secure transported materials.

Solid waste management

1. The site is to be kept clean, neat and tidy at all times.
2. No burning, burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted
3. Sufficient bins with sealable lids (preferably vermin and weatherproof) must be provided at the camp and work sites to store the solid waste produced on a daily basis.
4. Wherever possible, materials used or generated by construction shall be recycled.
5. Waste that is airlifted during the levelling process at the toe of the wall may be disposed of within the port if it does not affect the bathymetry of the port.

Sanitation

1. The Contractor shall provide toilets for use by workers. No sewerage must be dumped or disposed of in the marine environment.
2. The Contractor shall ensure that the toilets are maintained in a clean sanitary condition to the satisfaction of the PM. Toilets are to be serviced twice per week and toilet paper for staff shall be provided.
3. The Contractor shall ensure that chemicals and/or waste from toilet cleaning operations are not spilled on the ground at any time
4. Abluting anywhere other than in the toilets shall not be permitted
5. If reasonable access to existing toilets in the area is possible, it is preferred that these facilities are utilised.

Wastewater and contaminated water management

1. No grey water runoff or uncontrolled discharges from the site/working areas into the sea water shall be permitted.

2. Water containing pollutants such as cements, concrete and fuels shall be discharged into a conservancy tank or bunded for removal from site.
3. Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained.
4. The Contractor shall notify the PM and ECO of any pollution incidents on site.

Air emissions control

1. The Contractor will be required to ensure that all vehicles and plant used are maintained in good working order to help reduce air emissions.
2. Exhaust emission control devices are to be installed on vehicles and/or machinery identified by the PM to produce excessive emissions, where practical.
3. The PM may order the Contractor to remove plant or machinery producing excessive emissions from the construction site if such plant or machinery cannot be brought in compliance with air emission regulations.

Noise control

1. The contractor shall keep noise level within acceptable limits. The Contractor shall comply with all relevant guidelines and regulations.
2. All vehicles and machinery shall be fitted with appropriate silencing technology that shall be properly maintained.
3. The use of all plant and machinery shall be appropriate to the task required in order to reduce noise levels and/or environmental damage. Any complaints received by the Contractor regarding noise will be recorded and communicated to the PM and ECO.

Fire prevention and control

1. The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of his activities on site.
2. The Contractor shall ensure that there is basic fire-fighting equipment available on site.
3. The Contractor shall hold fire prevention talks with staff to create an awareness of the risks of fire.

Protection of fish and wildlife

1. No fishing will be allowed on site, nor poaching of any marine wildlife. Any Contractors' staff caught interfering with wildlife will face suspension from the project.

5.4 Construction Activities

Concrete handling

1. There shall be no concrete batching plant erected on site. The contractor shall make use of ready-mix concrete delivered to site on an as needed basis, as per the Subtech method statement.
2. All reasonable measures must be taken to ensure that transportation of concrete does not result in spillage.
3. Cleaning of equipment shall not result in pollution of the surrounding environment.
4. Waste concrete and cement sludge and mortar leftovers shall be scraped off and be removed to an approved landfill site. Dumping the remains into the sea is not acceptable.

Work stoppage and temporary site closure

1. The Engineer shall have the right to order work to be stopped in the event of significant infringements of the Project Environmental Management Specifications until the situation is rectified in compliance with the specifications. In this event, the Contractor shall not be entitled to claim for delays or incurred expenses.

5.5 Monitoring

Obligations of the parties

1. The Contractor shall inspect the site on a daily basis to ensure that the environmental specifications are adhered to.
2. The Contractor shall provide the PM with a verbal report, on a weekly basis, detailing both compliance with the EMPr as well as environmental performance.
3. The Contractor shall maintain a record of incidents (spills, impacts, complaints, legal transgressions, etc.) as well as corrective and preventative actions taken, for submission to the PM at the scheduled project meetings.
4. The ECO shall conduct audits to ensure that the system for implementation of the EMPr is operating effectively. The audit shall check that a procedure is in place to ensure that:
 - The EMPr and the Method Statements being used are the up to date versions.
 - Variations to the EMPr, Method Statements and non-compliances and corrective actions are documented.
 - Emergency procedures are in place and effectively communicated to personnel.

5.6 Audit schedule

The audit programme shall consist of 2 audits per week for the duration of the construction phase.

5.7 Compliance with the EMPr

The Contractor and/or his agents are deemed not to have complied with the EMPr and remedial action if:

1. Within the boundaries of the site or extensions there is evidence of contravention of the EMPr clauses.
2. Environmental damage ensues due to negligence.
3. The Contractor fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

5.8 Tolerances

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the works, but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operation required to complete the works.

It is thus required that the Contractor shall comply with the environmental requirements on an on-going basis and any failure on his part to do so will entitle the PM to certify the imposition of a penalty subject to the details set out.

6. COMPLETION OF CONTRACT AND DECOMMISSIONING OF THE SITE

6.1 Completion of contract

The Contractor is to provide timely notification to the PM of the impending completion of the works in order to provide an opportunity to identify work outstanding or incomplete. The PM is to provide timely notification to the ECO of contract completion so that a final audit can be arranged. These time frames are to be decided at an inception meeting.

6.2 Measurement and payment

Unless otherwise stated, no separate measurement and payment will be made to cover the costs of complying with the provisions of this EMPr and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

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7. CONCLUSIONS AND RECOMMENDATIONS

All potential impacts identified can be mitigated to low significance if the environmental specifications identified in this report are adhered to. It is recommended that this EMPr be included in all contractual documents, so that the contractor may adequately prepare themselves in terms of resources to adhere to the environmental management specifications.

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APPENDIX 1: CONSTRUCTION METHOD STATEMENT

TNPA – PORT ELIZABETH			
METHOD STATEMENT FOR REPAIR TO THE UNDERMINING AT THE QUAY			
SUB 13-PE-MS-00	Revision No: 00	19 July 2013	Page 1 of 6

**METHOD STATEMENT
FOR REPAIR TO THE UNDERMINING OF THE QUAY
WALL IN THE PORT OF PORT ELIZABETH**

Revision	COMPILED BY:	APPROVED BY:	Submission:	DATE:
0	Z Kathrada	F Scholtz	Proposal	19/07/2013



TNPA – PORT ELIZABETH			
METHOD STATEMENT FOR REPAIR TO THE UNDERMINING AT THE QUAY			
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TNPA – PORT ELIZABETH			
METHOD STATEMENT FOR REPAIR TO THE UNDERMINING AT THE QUAY			
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1 INTRODUCTION

1.1 Scope

This method statement describes the manner in which Subtech aims to undertake the repair to the undermining of the quay in the port of Port Elizabeth.

By implementing a system of gabion baskets and tremmie concrete we aim to fill the void created by the vessel propeller wash and prevent any further undermining in future.

2 RESOURCES

The following resources will be used for the works:

- Concrete Pump with Tremmie
- Compressor
- Crane Truck
- 50T Crane
- 8m RHIB
- Dive System
- Decompression Chamber


3 METHOD

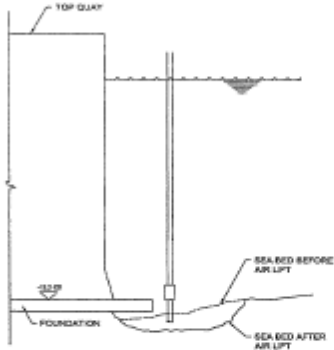
3.1 Survey

A bathymetric survey will be conducted prior to the dredging (In-Survey) using our Multi Beam survey equipment off the 8m RHIB. The survey data will be used to calculate how many gabion baskets need to be installed at the toe of the quay.

3.2 Air Lift for Gabion Basket Level

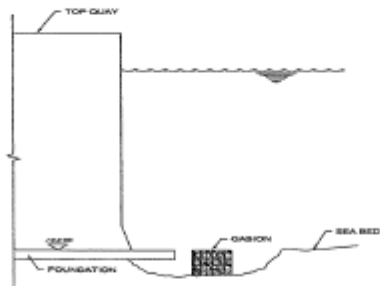
The dive team by using a compressor and tremmie pipe will endeavour to airlift silt at the toe of the quay creating a level platform for the installation of the Gabions

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3.3 Gabion Installation

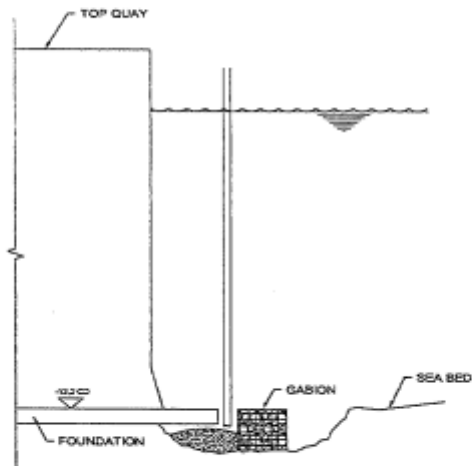
Bidim lined Gabion baskets which will be packed on the quay will be lowered by use of the 50T crane into the water to the harbour bed. The gabions with aid of the divers will be positioned at the toe of the quay and stitched together



3.4 Concrete In-Fill

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Once the bidim lined gabions are installed against the toe of the quay they will act as shutter for the concrete in-fill. A tremmie pipe connected to the concrete pump on the quay will be moved into the void by a dive team. Ready-Mix Concrete will then be pumped via the tremmie pipe into the void until the entire cavity is sealed



4 Safety


4.1 Land and Water Safety

- All personnel are to fulfill all PPE requirements
- All personnel are to be site inducted
- Persons operating the machinery shall be deemed fit to do so.
- Machinery safety checklists will be completed daily by operators.
- All equipment will be serviced regularly.
- Flagman to control any vehicles driving into the construction area

All personnel will adhere to the client's site specific regulations as well as with Subtech's policies and procedures.

4.2 Assessment of Significant Risks for Tasks

- Daily safety checklists will be completed, including hazard identification.
- Daily Toolbox talks to be completed, highlighting safety concerns.
- Method Statements will be read and explained to the pertinent operatives.

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- Risk Assessment to be discussed with workers.
- Safety talks to take place daily before work commences.
- Foreman/supervisor to fill out Daily HIRA highlighting job specific hazards, all employees to sign @ the back of form.
- All employees and operators must be medically fit and be inducted.
- Operators to fill out daily checklist on machinery.

4.3 Emergency Protocol

- The site designated first aiders will administer first aid treatment.
- Emergency evacuation procedures will be on display.
- All relevant signage will be displayed
- All certification will be on hand.
- Toolbox Talks will be conducted daily prior to work.
- Emergency Contact Numbers will be distributed and displayed on notice boards:

The table below are necessary contact numbers for the project:

Name	Surname	Designation	Contact No
Paul	Bouton	Site Agent	0764311796
Brayn	Stone	Safety Officer	0828748821
Zain	Kathrada	Contracts Manager	0826111869



APPENDIX 2: CES IMPACT ASSESSMENT METHODOLOGY

Five factors need to be considered when assessing the significance of impacts, namely:

- Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.
- The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.

The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.

- The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked with scores assigned as presented in Table 3-2 to determine the overall **significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 3-1, to determine the overall significance of the impact. The overall significance is either negative or positive.

The significance scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of a social nature need to reflect the values of the affected society.

Cumulative Impacts

Cumulative Impacts affect the significance ranking of an impact because it considers the impact in terms of both on-site and off-site sources. For example, pollution making its way into a river from a development may be within acceptable national standards. Activities in the surrounding area may also create pollution which does not exceed these standards. However, if both on-site and off-site activities take place simultaneously, the total pollution level may exceed the standards. For this reason it is important to consider impacts in terms of their cumulative nature.

Seasonality

Although seasonality is not considered in the ranking of the significance, it may influence the evaluation during various times of year. As seasonality will only influence certain impacts, it will only be considered for these, with management measures being imposed accordingly.

Table 1. Ranking of Evaluation Criteria

EFFECT	Temporal scale		
	Short term	Less than 5 years	
	Medium term	Between 5 and 20 years	
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	
	Spatial Scale		
	Localised	At localised scale and a few hectares in extent	
	Study area	The proposed site and its immediate environs	
	Regional	District and provincial level	
	National	Country	
	International	Internationally	
		Severity	
	Slight / Slightly Beneficial	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected system(s) or party(ies)
	Moderate / Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party(ies)
	Severe / Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) or party(ies)
	Very Severe / Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party(ies)
LIKELIHOOD	Likelihood		
	Unlikely	The likelihood of these impacts occurring is slight	
	May Occur	The likelihood of these impacts occurring is possible	
	Probable	The likelihood of these impacts occurring is probable	
	Definite	The likelihood is that this impact will definitely occur	

* In certain cases it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know

Table 2. Ranking matrix to provide an Environmental Significance

Environmental Significance		Positive	Negative
LOW	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent development. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.		
MODERATE	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which, in		

	<p>conjunction with other impacts may prevent its implementation.</p> <p>These impacts will usually result in either positive or negative medium to long term effect on the social and/or natural environment.</p>		
HIGH	<p>A serious impact which, if not mitigated, may prevent the implementation of the project.</p> <p>These impacts would e considered by society as constituting a major and usually long term change to the natural and/or social environment and result in severe negative or beneficial effects.</p>		
VERY HIGH	<p>A very serious impact which may be sufficient by itself to prevent the implementation of the project.</p> <p>The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects or very beneficial effects.</p>		

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