TRANSNET NATIONAL PORTS AUTHORITY

CONSTRUCTION OF MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

Draft Basic Assessment Report

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CONFIDENTIALITY STATEMENT

TRANSNET NATIONAL PORTS AUTHORITY

CONSTRUCTION OF MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

DRAFT BASIC ASSESSMENT REPORT

TABLE OF CONTENTS

APPENDICES

TRANSNET NATIONAL PORTS AUTHORITY

CONSTRUCTION OF MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

DRAFT BASIC ASSESSMENT REPORT

EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT DESCRIPTION

SiVEST Environmental Division was appointed by Transnet National Ports Authority (TNPA) to undertake the Basic Assessment (BA) Process in terms of the EIA Regulations of 2014 (as amended in 2017) for the construction of marine infrastructure in the Port of Richards Bay. The initial proposal included the construction and operation of a Floating Dry Dock. However following the conclusion of the specialist studies, TNPA decided that the Operator of the Floating Dry Dock will need to apply for environmental authorisation separately.

TNPA is therefore proposing to extend and develop the existing repair quay in the Port of Richards Bay. The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility.

TNPA is applying for authorisation to construct the following supporting marine infrastructure:

a) Revetment structure to absorb the energy of the ocean water and scour protection;
   - The revetment area will need to be dredged. It should be noted that a larger area is to be dredged during construction to provide a stable slope for the placement of rock for the revetment. The revetment structure is then backfilled to tie-in with the original ground levels. Scour rock will be placed on the slope below the jetty structure where erosion of soft material is a risk.
b) Mooring structures (mooring dolphins) to ensure that the vessels are secured as well as an access jetty;
   - Piles for the mooring dolphins and jetty structure will be driven with barge and crane mounted vibratory hammer. A rock drill will be used to increase the founding depth. Reinforcing and concrete work will be carried out from the barge. Precast elements will also be placed by the barge and crane or with a land-based mobile crane, where reach is not an issue.
c) Landside area facilities;
   - This phase of the construction involves the site preparation of the repair quay landside area. The scope of the project excludes the infrastructure within the landside area, but includes paving and installation / connection of services.
d) Service connections to the boundary of the area (potable water, sewer, electrical & stormwater).
   - Currently there is a 150mm diameter water pipeline. There are servitudes for pipes, communications, sewer and electrical.

Capital dredging will be carried out by a trailer suction hopper dredger for the dredging of sand and silt. The dredge slurry is loaded onto hopper barges and disposed of at a licenced offshore dump site. An estimated total of 1 420 150m^3 will be dredged and disposed of offshore.

APPLICABILITY OF NEMA EIA REGULATIONS, 2014 (AS AMENDED IN 2017)

The following activities are applied for:

Listing Notice	Activity	Description
GNR 327, April 2017	Activity 19A 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 of more than 5 cubic metres from— (ii) an estuary	The existing repair quay is located in an Estuarine Bay. Capital dredging works will be undertaken within the harbour area. A Trailer Suction Hopper Dredger will be dredging sand and silt. An estimated total of 1 420 150 m^3 will be dredged from the area where the existing repair quay is located and disposed of offshore. The applicant currently has a maintenance dredging permit in place (permit number 06/2017). A new permit will have to be applied for.
	Activity 54 The expansion of facilities— (ii) in an estuary; in respect of— (a) fixed or floating jetties and slipways; (d) rock revetments or stabilising structures including stabilising walls; or (f) infrastructure or structures where the development footprint is expanded by 50m^2 or more	The following supporting infrastructure is required for the modification and alteration of the existing repair quay, and will occur within the Estuarine Bay: • Revetment structures • Mooring structures (i.e. Mooring Dolphins) • Access jetty

DETAILS OF ALTERNATIVES CONSIDERED

It was not considered necessary to investigate site or location alternatives as the proposed site already has an existing repair quay that will be expanded and, if approved, will assist in providing marine infrastructure for a Floating Dry Dock. Furthermore given that the area that is proposed already has an existing repair quay and that the intention of the proposed project is to provide marine infrastructure for the operation of a Floating Dry Dock, in support of the proposed Ship Repair Facilities at the Port, no other land use alternatives were considered.

Two options was considered for the disposal of the dredged material. WSP Environmental Pty) Ltd was appointed to assess whether the dredged material can be disposed of offshore or terrestrially. The findings of their study was that the dredged material was non-hazardous and disposal could be either offshore or terrestrially. Approximately 1.4 million m^3 of dredged material will need to be disposed of and as a result of this volume the preferred alternative is to dispose of it offshore. TNPA has an existing disposal site that covers an area of approximately 1.7 million m^2. Currently TNPA has a maintenance dredging permit (Permit no 06/2017) in place to dredge a volume of 1.2 million m^3 that expiries in March 2018. An application for a new dredging permit will therefore be required. The Oceans and Coastal Branch of Department of Environmental Affairs is being consulted with in this regard.

In terms of the No-Go Alternative, the existing repair quay would not be expanded in support of the proposed Ship Repair facilities (Floating Dry Dock) at the Port. TNPA's tug boats would continue to sail to Durban for annual maintenance. The Port of Richards Bay would therefore not save costs on fuel, labour and transportation as the tug boats will continue to be serviced in Durban as there will not be a facility available for a Floating Dry Dock. Larger ships would continue to be turned away as the facilities will not be available/adequate for repairs. Furthermore the existing Dormac Floating Dry Dock in Durban would continue to be under pressure to service larger vessels. Additionally Cape size vessels will also not be able to be serviced as there will be no facilities for a Floating Dry Dock able to provide this service to vessels of such a size in South Africa. This will result in lost opportunity to the South African Ports as there would be no facility available to service ships of this size. The Applicant will furthermore fail in terms of the initiative that has been identified as part of Operation Phakisa. No significant benefits associated with the No-Go Alternative have been identified. No environmental risk factors were determined which should prevent the proposed expansion of the repair quay and associated infrastructure at the Port of Richards Bay.

PUBLIC PARTICIPATION PROCESS UNDERTAKEN

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

SiVEST distributed Background Information Documents (BID's) to I&AP's via email on the 25th of January 2018. Site notices were placed around the vicinity of the site on the 25th of January 2018. Site notices were also placed at TNPA's permit office, the City of uMhlathuze as well as the Library. A Zulu and English advert was placed in the Zululand Observer on the 25th of January 2018. Two queries were raised in response to the BID distribution: Whether alternative locations had been considered (noting that the Casuarine site was not suitable) and whether the development will have an impact on passenger ships docking in the area).

Registered stakeholders will be provided with a further opportunity to provide comments. The Draft BAR will be made available for a 30 day comment period. The documents will also be made available on SiVEST's website (www.sivest.co.za/Downloads.aspx) for review and comment.

All issues that are raised during the review period for the DBAR (this report) will be recorded and addressed by the Environmental Assessment Practitioner (EAP) in a Comments and Responses Report (C&RR) attached to the Final BAR and the Final Report will be amended, as necessary based on issues or concerns raised (to be attached as **Appendix E** of the FBAR).

The Final BAR will be submitted to the DEA with all comments received and responses sent during the public comment period.

RECEIVING ENVIRONMENT

The proposed site is located at Newmark Road, Small Craft Harbour in Richards Bay and falls within the King Chetwsayo District Municipality in Kwazulu Natal.

The Small Craft harbour is used as a recreational area and the Tuzi Gazi Waterfront is located to the north of the existing repair quay.

The existing repair quay **(Figure 1)** is a hard surfaced area with existing buildings located on the site. The water and power supply are located in service trenchers and manholes along the quay.

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Figure 1: Looking eastwards along existing repair quay

The repair quay is located in an estuarine bay and no vegetation of any significance exists on the site. *While the proposed site supports sheltered, shallow subtidal and intertidal marine habitats known for high diversity and productivity, it was found that benthic communities were impacted and that none of the affected areas supported any biodiversity not well represented elsewhere in the bay* (Estuarine Impact Assessment undertaken by MER and attached in Appendix F).

IMPACT METHODOLOGY USED

The SiVEST Impact Assessment method, dated 28 July 2017 (attached as **Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
Habitat loss as a result of capital dredging	Capital dredging will result in the direct loss of habitat in dredged areas and adjacent shallow subtidal habitats where the slope will recede to achieve a natural angle of repose. This will alter the extent of low productivity deep subtidal habitat (increase), and moderately productive shallow subtidal habitat (decrease). Although over time natural deposition processes would result in progressive shallowing of the affected areas on-going maintenance dredging to retain this new configuration would make habitat loss effectively permanent.	No mitigation possible	Medium negative	The replacement of sand banks with deep subtidal habitat will reduce overall estuarine productivity in the bay, however the affected areas are not particularly diverse or productive when compared against similar areas such as the Kabeljou Flats. Cumulative impacts were therefore considered to be low.	Local	Permanent	Definite
Increased turbidity as a result of capital dredging	Maintenance dredging has been reported to result in turbidity levels of 54 NTU at the mouth (DEA 2017), which would equate to a ten-fold increase. Although the effects would be temporary given the diurnal (twice a day) turnover of water with tidal exchange, it is anticipated that the capital dredging would require weeks or months to complete and that operations would continue during daylight hours over this period.	The implementation of best practice mitigation options included in the TNPA maintenance dredging management plan would reduce the intensity and therefore significance of impacts. However, given the urgency of implementation, options to limit dredging operations may be precluded. The post-mitigation rating above would only apply if dredging is only undertaken using least-impact techniques such as the clamshell dredger: • During slack tide and low tide periods; • At low to moderate excavations rates; • Using bubble net technology to prevent the transport of sediment to other part of the Bay and • Strict hopper loading management to avoid the loss of dredge spoil into the bay during transport. Should only some of the mitigation measures listed above be implemented, the significance would be reduced to medium.	High negative	Considering that the capital dredging would be concurrent with the current trend of increased maintenance dredging, cumulative effects were rated as medium.	Regional	Short term	Definite

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	**Mitigation**	**Significance after mitigation**	**Consequence**	**Extent**	**Duration**	**Probability**
Re-suspension of contaminated sediments during capital dredging	Inorganic contaminants, particularly heavy metals, may be bound to sediment particles that are re-suspended in the water column during dredging (MacKay, Kelbe, Simmonis & Cyrus 2003). This may result in increased bio-availability of toxic substances previously bound by the sediment with subsequent impacts on the health and productivity of estuarine biota. In the absence of sediment quality data at the proposed site it has been assumed that there is some level of contamination given that: • the site is located adjacent to existing high traffic deep water channels, • the beaches, intertidal and shallow subtidal habitats to the west of the site have been identified as depositional areas, and • the deeper areas of the site were characterised by fine sediments, which are often associated with increased pollutant concentrations.	Sediments at the proposed site must be tested for contamination by heavy metals, ammonia, cyanide, fluoride, hydrogen sulphide, organotin (tributylin) and total petroleum hydrocarbons (parameters with TWQRs for the natural marine environment). Should contamination be detected the best practice mitigation for turbidity management should be applied.	Low negative	-	Regional	Medium to long term	Definite
Habitat loss at mooring dolphins	This would result in the permanent loss of disturbed deep water habitat.	No mitigation possible	Low negative	-	The specifications for the mooring dolphins are unknown making habitat loss difficult to quantify, however the structures would be established within the proposed site.	Permanent	Definite

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	**Mitigation**	**Significance after mitigation**	**Consequence**	**Extent**	**Duration**	**Probability**
Potential impacts on water and sediment quality	Construction of the mooring dolphins would require the use of heavy plant and potentially hazardous substances such as concrete. These activities therefore pose a risk to water and sediment quality.	• As far as possible, components of the mooring dolphins should be pre-cast and floated to the proposed site for positioning. This would avoid unnecessary risks associated with handling hazardous substances at the proposed site. • A spill contingency plan must be developed to ensure that best practice remediation is immediately effected in the event of an incident.	Low negative	Port operations have undoubtedly resulted in the cumulative contamination of sediments in the bay as these settle out of the water column, and impacts are anticipated to increase with on-going expansion. The potential for sediment contamination associated with this activity was rated as medium	Local	Short term	Possible
Construction noise and vibration	Despite the high levels of disturbance associated with the dredging that would take place, fish are highly mobile and it is likely that they would continue to traverse the site. The use of a vibratory hammer and rock drill to drive the mooring dolphins into the bed of the estuary would result in levels of vibration and noise that may reach lethal levels for fish in the vicinity. While there may be similar impacts on invertebrates these activities would be conducted following the capital dredging and these communities would have largely been removed from the site and all areas within several hundred metres. There would be no direct risk to invertebrate fauna. Local avifauna would likely vacate this area of the bay during high intensity activities. Given the relatively limited community of fairly generalist species observed during the site survey, this would be unlikely to be highly significant. However, should these activities be conducted during the summer months roosting areas on local beaches and intertidal sand banks would be unavailable to the considerable population of migrant waders that utilise these habitats.	No mitigation necessary.	Low negative	-	Local	Short term	Probable

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	**Mitigation**	**Significance after mitigation**	**Consequence**	**Extent**	**Duration**	**Probability**
Maintenance dredging impacts on benthic invertebrate communities	Maintenance dredging would result in the periodic loss and disturbance of local benthic macroinvertebrate fauna. The communities that re-colonise the site following the installation of the floating dry dock would likely be altered and would be similar to those that exist in other deep water channels in the bay. These sites were characterised by a low diversity and abundance of robust taxa tolerant of disturbance.	No mitigation possible.	Medium negative	Given that the benthic communities characterising the site were found to be of low diversity and abundance, but that community composition would be detrimentally altered, cumulative impacts were rated as low.	Local	Permanent	Definite
Maintenance dredging impacts on water quality	Maintenance dredging would have similar impacts on local water quality to capital dredging. The decreased volumes of sediment to be disturbed would generally result in a lower intensity of impact, however the likelihood of increasing contamination of sediments at the site as a result of the dry dock operations would increase the risk of re-suspension of contaminants.	Mitigation measures should follow best practice dredging operations.	Medium	Given that the bay has been considered to have existing water quality impacts as a result of port operations, cumulative impacts were rated as medium.	Local	Permanent	Definite
Dust soiling	Emission of dust / Dust soiling: dust deposition, resulting in the soiling of surfaces; and / or visible dust plumes, which are evidence of dust emissions	Mitigation for all sites: Communications: • Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. • Display the head or regional office contact information. Mitigation for all sites: Dust Management: • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.	High	-	Local	Permanent	Possible

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
		Site Management • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. Monitoring • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Preparing and maintaining the site • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping.					

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
		Operating vehicle/machinery and sustainable travel • Although no specific mitigation measures are proposed for vehicle emissions, all vehicles and equipment will undergo regular maintenance, will be operated to manufacturers' guidelines. • Ensure all vehicles switch off engines when stationary - no idling vehicles. Where black smoke is observed, the equipment will be safely shut down and maintenance measures undertaken. • Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Produce a Construction Logistics Plan to manage the delivery of goods and materials. Operations • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. Waste management • Avoid bonfires and burning of waste materials.					

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	**Mitigation**	**Significance after mitigation**	**Consequence**	**Extent**	**Duration**	**Probability**
		Measures specific to earthworks • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Measures specific to construction • Avoid scabbling (roughening of concrete surfaces) if possible. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.					
Dust impacts on human health	Emission of dust: from: Increased emissions of PM10 has the potential to adversely affect human health.	Mitigation measures as per above.	High	-	Local	Permanent	Possible
Dust impacts on the ecological environment	Emission of dust: from: Increased emissions of dust has the potential to adversely affect the ecological environment.	Mitigation measures as per above.	High-	-	Local	Permanent	Possible
Noise	An increase in ambient noise levels at sensitive receptors by 7 or more dB(A).	Specific Mitigation Measures: • As far as possible, the noisiest construction activities should be undertaken away from SR1 (i.e. the western areas of the project site). The construction laydown areas should be located based on the same principle. • Site Hoarding should be erected along the project site boundary between SR1 and the construction activities especially where there is no direct noise screening afforded by existing infrastructure). General Measure: • General best practice guidelines for construction noise mitigation have been recommended as per Section 5.2 of the Noise Impact Assessment. It is anticipated that with effective implementation of these measure that the impact of construction activities on the acoustic environment at sensitive receptors will be mitigated to "Negative Low"	Medium	It is possible that the increase in noise levels may result in potential for cumulative negative impacts if concurrent activities take place (construction of other projects in the vicinity of the sensitive receptors)	Local	Short term	Probable
Job creation during construction	A number of jobs will be created during the construction phase of the project.	No mitigation required.	High	-	Medium	Short term	Definite

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
Provision of facilities for a ship repair facility	The marine infrastructure will provide the necessary infrastructure required for a ship repair facility	No mitigation required.	Very high	-	Very high	Permanent	Definite
No go alternative	This will be with the existing repair quay remaining the same and no further development taken place	No mitigation required.	Very high	-	Very high	Permanent	Probable
Loss of employment opportunities	No jobs will be created	No mitigation required.	High	-	High	Permanent	Definite
No provision of infrastructure for a ship repair facility	Failure to provide the necessary marine infrastructure required for a ship repair facility	No mitigation required.	Very high	-	Very high	Permanent	Definite

POSITIVE AND NEGATIVE IMPACTS OF THE EXPANSION OF THE EXISTING REPAIR QUAY AND THE RELATED MARINE INFRASTRUCTURE

Impact	Pre-mitigation	Post-mitigation
Expansion of Existing Repair Quay & Related Marine Infrastructure		
Habitat loss as a result of capital dredging	Medium negative	No mitigation possible
Increased turbidity as a result of capital dredging	High negative	Low negative
Resuspension of contaminated sediments during capital dredging	Low negative	Very low negative
Habitat loss as a result of supporting infrastructure	Low negative	No mitigation possible
Potential impacts on water and sediment quality	Low negative	Very low negative
Construction noise and vibration	Low negative	No mitigation possible
Maintenance dredging impacts on benthic invertebrate communities	Medium negative	No mitigation possible
Maintenance dredging impacts on water quality	Medium negative	Low negative
Dust soiling	Medium negative	Low negative
Dust impacts on human health	High negative	Low negative
Dust impacts on ecological environment	High negative	Low negative
Impacts on noise sensitive receptors	Medium negative	Low negative
Job creation during construction period	Medium positive	No mitigation required
Provision of infrastructure for a ship repair facility	Very high positive	No mitigation required
No-go Alternative		
Loss of employment opportunities	Medium negative	No mitigation possible
No provision of infrastructure for a ship repair facility	Very high negative	No mitigation

ENVIRONMENTAL IMPACT STATEMENT:

The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility. The proposed development triggers various activities in terms of the EIA Regulations of 2014 (as amended in 2017). Authorisation for the Floating Dry Dock Facility will be applied for separately.

The proposed development will see a number of jobs created during the construction phase. The construction of marine infrastructure will provide the necessary infrastructure required for a ship repair facility (Floating Dry Dock) that will be able to service larger vessels such as Cape sized vessels. The Estuarine Impact Assessment found that there may be localised residual negative impacts of medium significance but that the proposed activities would not be anticipated to substantially impact on the health of the Richards Bay estuary overall. The study has recommended that a conditional approval be granted with provisions for the application of best practice construction and operational phase activities.

The development is furthermore in line with KZN's Provincial Growth and Development Strategy. Strategic Objective 4.1 refers to the Development of seaports and airports. The ports of KZN operate at optimal capacity and offer greater potential to increase connectivity both at domestic and international level.

The uMhlathuze Local Municipality's IDP (http://www.umhlathuze.gov.za/images/IDP.pdf) states that harbour development has provided the drive for large-scale industrial growth. This is seen as an opportunity in terms of uMhlathuze's SWOT analysis (strengths, weaknesses, opportunities, threats). The development of the marine infrastructure that will support a Floating Dry Dock will attract ships normally going to Durban for repairs to Richards Bay. The development is therefore in line with the IDP as it will lead to growth. Another goal of the Municipality is to have Viable Economic Growth and Development and job creation and this development is in line with this goal.

TNPA have also identified the need for the development in their National Ports Plan of 2016 and the development falls within Initiative 7 of Operation Phakisa - Implement Strategic Prioritised Projects – Richards Bay.

The business interests of the development are:

- Potential for marine revenue benefits;
- More business will be attracted with the introduction of the Floating Dry Dock;
- The Floating Dry Dock will be utilised for the annual maintenance of the Port tuck and pilot boats. Currently the boats have to sail to Durban for annual maintenance. The Port will therefore save costs on fuel, labour, time and transportation.
- Creation of more jobs (i.e. Millwrights, Electricians, Fitters, Riggers, Plumbers, Crane Operators, General Workers, Technicians and etc.) during both construction and operation.

The Port is expected to expand in future and the number of vessels calling to the Port of Richards Bay will also increase. Therefore it is expected that, there will be more vessels requiring maintenance / repairs and the proposed Floating Dry Dock will be utilised for that function.

TRANSNET NATIONAL PORTS AUTHORITY

CONSTRUCTION OF MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

DRAFT BASIC ASSSESSMENT REPORT

1. INTRODUCTION

SiVEST SA (Pty) Ltd has been appointed by Transnet National Ports Authority (TNPA) to undertake the Basic Assessment (BA) Process in line with the National Environmental Management Act, 1198 (Act 107 of 1998).

TNPA is proposing to extend and develop the existing repair quay in the Port of Richards Bay. The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility.

The proposed development triggers two activities in terms of the EIA Regulations of 2014 (as amended in 2017). The listed activities triggered are discussed in Section 7.2 below. **Authorisation for the Floating Dry Dock Facility will be applied for separately.**

2. PROJECT TITLE

Expansion of Existing Repair Quay and related Marine Infrastructure in the Port of Richards Bay.

3. DETAILS OF APPLICANT

3.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Business Name of Applicant	Transnet National Ports Authority
Physical Address	Port of Richards Bay
Postal Address	PO Box 181, Richards Bay
Postal Code	3900
Telephone	035 905 4651
Fax	035 905 3189
Email	Motsamai.Mohoalali@transnet.net

4. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTIONER AND SPECIALISTS

4.1 Name and contact details of the Environmental Assessment Practitioner (EAP)

Name and contact details of the EAP who prepared this report:

Table 1: Name and contact details of EAP who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	3 Palm Court, 15 Lira Link Road, Richards Bay
Postal Address	PO Box 1874, Richards Bay
Postal Code	3900
Telephone	035 789 2066
Fax	035 789 2070
Email	marelizeb@sivest.co.za

4.2 Names and expertise of representatives of the EAP

Table 2: Names and details of the expertise of each representative of the EAP involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette	MEnvMgt. (Environmental Management)	IAIA	19
Marelize Berning	BA (Environmental Management)	IAIA	12

CV's of SiVEST personnel is attached in **Appendix A.** The EAP declaration is attached in **Appendix A**.

4.3 Names and expertise of the specialists

Table 3: Name and expertise of specialists

Name of representative of specialist	Position	Educational Qualifications	Experience (years)
MER	**Estuarine Study**		
Nicolette Forbes	Estuarine Scientist	B.Sc., B.Sc. (Honours), M.Sc.	25
Bianca Morgan	Senior Consultant	B.Sc; B.Sc (Hons)	10
Ward Karlson Consulting	**Noise and Air Quality**		
Marc Blanché	Project Manager	*Pr Sci Nat*	10
Shivani Naidoo	Project Engineer (Air Quality	BSc. Chemical Engineering	2
Ashley Meyer	Project Engineer (Noise)	BEng. Mech. Mechanical Engineering	2

Name of representative of specialist	Position	Educational Qualifications	Experience (years)
Contract Maritime Archaeologist	**Underwater Heritage Impact Assessment**		
Vanessa Maitland	Maritime Archaeologist	Archaeology (Hons)	13
Nako Iliso	**Traffic**		
Seniel Pillay	Civil Engineer	BSc. Engineering	22
Khaveer Jayraj	Transportation Technologist	B-Tech Civil Engineering	7
WSP	**Disposal of dredged materials**		
Adam Sanderson	Senior Associate	Cert.Sci.Nat.A	15
Siyabonga Magcaba	Assistant Consultant (Geologist)	BSc. Honours	1.8

The specialist studies and declarations are attached in **Appendix F**.

5. LOCATION OF THE ACTIVITY

5.1 21 Digit Surveyor General Code of the site

The Surveyor General code for the site is: NOGV0223000162300000.

5.2 Physical Address of the site

The site is located at Newmark Road, Richards Bay. The site locality is attached in **Appendix B.**

5.3 Coordinates of the site

The coordinates for the site are as follows:

Latitude: 28° 47' 46.62"S
Longitude: 32° 4' 37.63"E

6. SITE DEVELOPMENT PLAN

The Site Development Plan is attached in **Appendix C**.

7. ACTIVITY INFORMATION

7.1 Project Description

TNPA is proposing to extend and develop the existing repair quay in the Port of Richards Bay. The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility. Authorisation for the Floating Dry Dock Facility will be applied for separately.

TNPA is therefore applying for authorisation to construct the supporting marine infrastructure that is required for the operation of a floating dry dock facility and that entails the following:

a) Revetment structure to absorb the energy of the ocean water and scour protection;
   - The revetment area will need to be dredged. It should be noted that a larger area is to be dredged during construction to provide a stable slope for the placement of rock for the revetment. The revetment structure is then backfilled to tie-in with the original ground levels. Scour rock will be placed on the slope below the jetty structure where erosion of soft material is a risk.

b) Mooring structures (mooring dolphins) to ensure that the vessels are secured as well as an access jetty;
   - Piles for the mooring dolphins and jetty structure will be driven with barge and crane mounted vibratory hammer. A rock drill will be used to increase the founding depth. Reinforcing and concrete work will be carried out from the barge. Precast elements will also be placed by the barge and crane or with a land-based mobile crane, where reach is not an issue.

c) Landside area facilities;
   - This phase of the construction involves the site preparation of the repair quay landside area. The scope of the project excludes the infrastructure within the landside area, but includes paving and installation / connection of services.

d) Service connections to the boundary of the area (potable water, sewer, electrical & stormwater).
   - Currently there is a 150mm diameter water pipeline. There are servitudes for pipes, communications, sewer and electrical.

Capital dredging will be carried out by a trailer suction hopper dredger for the dredging of sand and silt. The dredge slurry is loaded onto hopper barges and disposed of at a licenced offshore dump site. An estimated total of 1 420 150m^3 will be dredged and disposed of offshore.

All common port infrastructure such as channels, revetments and quay walls shall be designed for a working life of 50 years. All supporting or project specific infrastructure such as mooring systems, site services and lighting shall be designed for a working life of 20 years.

This project is based on a concession being given to a private Terminal Operator (TO) who will mobilise a Floating Dry Dock, establish the required ship repair facility and operate the terminal. The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility.

The terminal operator will typically carry out vessel surveys which includes cleaning of hulls, inspecting, painting, minor repairs and replacement anodes which will be worked on over periods of between 2 – 4 weeks.

7.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327 for activities which must follow the Basic Assessment Process. The project will trigger the following listed activities:

Table 4: Listed activities triggered

Listing Notice	Activity	Description
GNR 327, April 2017	Activity 19A 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 of more than 5 cubic metres from (ii) an estuary	The existing repair quay is located in an Estuarine Bay. Capital dredging works will be undertaken within the harbour area. A Trailer Suction Hopper Dredger will be dredging sand and silt. An estimated total of 1 420 150 m^3 will be dredged from the area where the existing repair quay is located and disposed of offshore. The applicant currently has a maintenance dredging permit in place (permit number 06/2017). A new permit will have to be applied for.
	Activity 54 The expansion of facilities— (ii) in an estuary; in respect of— (a) fixed or floating jetties and slipways; (d) rock revetments or stabilising structures including stabilising walls; or (f) infrastructure or structures where the development footprint is expanded by 50m^2 or more	The following supporting infrastructure is required for the modification and alteration of the existing repair quay, and will occur within the Estuarine Bay: • Revetment structures • Mooring structures (i.e. Mooring Dolphins) • Access jetty

8. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

8.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

8.2 National Environmental Management Act

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "development must be socially, environmentally and economically sustainable", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The proposed construction of marine infrastructure require authorisation in terms of NEMA and the Basic Assessment (BA) Process is being undertaken in accordance the EIA Regulations 2014 (as amended in 2017) that consist of the following:

- Listing Notice 1 - GN No. 327 (7 April 2017); and
- BA procedure - GN No. 326 (7 April 2017);

The project triggers activities under Listing Notice 1 and thus needs to be subjected to a Basic Assessment Process. The listed activities are explained in Section 7.2 above.

8.3 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment and management of national heritage resources (operating at a national, provincial and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial and local significance.

Under the legislation the South African Heritage Resources Agency (SAHRA), was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions.

There is extensive national legislation covering heritage and archaeological sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that an assessment of potential heritage resources in the development area needs to be done. This is the purpose of the desktop study and the magnetometer survey which has been undertaken and the report is attached in **Appendix F**.

8.4 Integrated Coastal Zone Management Act (24 of 2008)

The Integrated Coastal Zone Management Act (24 of 2008) includes the following key themes:

- To establish a system of integrated coastal and estuarine management that includes norms, standards and policies that promote the conservation of the coastal environment
- Maintaining the natural attributes of the coastal landscapes and seascapes
- To ensure that development and the use of natural resources within the coastal zone is socially and economically justifiable and ecologically sustainable.
- To define rights and duties in relation to coastal areas.
- To prohibit incineration at sea
- To control dumping at sea, pollution in the coastal zone, inappropriate development of the coastal environment and other adverse effects on the coastal environment.
- To give effect to South Africa's international obligations in relation to coastal matters.
- Provide for matters connected therewith.

The legal definition of an estuary has been established in the National Environmental Management: Integrated Coastal Management Act No. 24 of 2008, where "estuary" means:

"a body of surface water -
(a) that is permanently or periodically open to the sea;
(b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the body of surface water is open to the sea; or
(c) in respect of which the salinity is higher than fresh water as a result of the influence of the sea, and where there is a salinity gradient between the tidal reach and the mouth of the body of surface water".

As the Port has been established in an estuarine bay, an Estuary Impact Assessment has been undertaken to inform the mandatory environmental authorisations required for the project. The report is attached in **Appendix F.**

8.5 National Environmental Management: Air Quality Act (NEM AQA), Act No.39 of 2004

Under the National Environmental Management: Air Quality Act (NEM AQA), Act No.39 of 2004 [3] [4], ambient air quality standards (AAQS) have been set for the protection of human health in South Africa.

An Air Quality Impact Assessment has been undertaken. The report is attached in **Appendix F.**

8.6 Operation Phakisa

The State President launched Operation Phakisa on 8 July 2014 that forms part of the Oceans Economy and is a key driver for job creation and economic growth for South Africa. Operation Phakisa is designed to fast track the implementation of solutions to critical development issues. The Oil, Gas and vessel repair sector represents a huge untapped opportunity to attract sustainable business opportunities to the South African Ports. Refer to **Appendix I** for an extract.

The coast line of South Africa is almost 3 000km long (3 900km when the sub-Antarctic islands of Marion Island and Prince Edward Island in the Southern Ocean is included). There are nine major ports in South Africa that have opportunities for growth. Approximately 30 000 vessels pass through South African waters with approximately 13 000 vessels docking in South African Ports. Furthermore, approximately 300 million tonnes of cargo on foreign-owned vessels are shipped and 1.2 million tonnes of liquid fuel passes along our coast on an annual basis. Government has therefore seen this as an economic opportunity to invest in port infrastructure. Over the last 12 months 200 jobs have already been created and R7 billion created in building new port facilities, as well as the refurbishment and maintenance of existing ports. This was through the adoption of a Public-Private Partnership model by Transnet National Ports Authority. TNPA has committed to over R7 billion to ensure South Africa's ports have the infrastructure capability to capitalise on these opportunities.

A number of initiatives (18 in total) were identified within the Phakisa Marine Transport and Manufacturing Laboratory as detailed below:

- Create supporting funding model
- Establish purpose built O&G infrastructure – Saldanha Bay
- Align on implementation of government policy
- Prioritise Transnet and TNPA funding allocation
- Maintain and refurbish existing facilities
- Unlock investment in port facilities
- **Implement Strategic Prioritised Projects – Richards Bay**
- Create dedicated Occupational Teams
- Train learners as artisans
- Increase usage of ESSA system
- Increase capacity for seafarers
- Public procurement and localisation programme
- Strategic marketing campaign
- Preferential procurement in the African Maritime Charter
- Implement Prioritised Projects – East London
- Train 2 550 TVET college graduates
- Establish Trade RPL/Centres in Saldanha Bay and Richards Bay
- Support local registry of vessels through incentives to use SA flagged ships

Initiative 7 envisages the development of a Ship Repair Facility that would service the following niche markets:

- Cargo vessels calling at Richards Bay;
- Cargo vessels calling at Durban (excess demand); and

- Offshore supply vessels deployed on East-African offshore oil and gas fields.

TNPA is proposing to extend and develop the existing repair quay in the Port of Richards Bay. The objective of this project is to provide marine infrastructure needed to accommodate a Floating Dry Dock along the Repair Quay and to provide the required bulk infrastructure for such a facility. Authorisation for the Floating Dry Dock Facility will be applied for separately.

8.7 KZN Provincial Growth and Development Strategy

Reference is made to the KZN Provincial Growth and Development Strategy (Source: http://www.kznonline.gov.za/images/Downloads/Publications/ppc.pdf). Refer to **Appendix I** for an extract.

Strategic Objective 4.1 refers to the Development of seaports and airports. The ports of KZN operate at optimal capacity and offer greater potential to increase connectivity both at domestic and international level.

This development is therefore in line with this objective.

8.8 uMhlathuze Municipality SDF

Reference is made to the uMhlathuze Local Municipality's IDP (http://www.umhlathuze.gov.za/images/IDP.pdf). Refer to **Appendix I** for an extract. The IDP states that harbour development has provided the drive for large-scale industrial growth. This is seen as an opportunity in terms of uMhlathuze's SWOT analysis (strengths, weaknesses, opportunities, threats). The development of the marine infrastructure that will support a Floating Dry Dock will attract ships normally going to Durban for repairs to Richards Bay. The development is therefore in line with the IDP as it will lead to growth. Another goal of the Municipality is to have Viable Economic Growth and Development and job creation and this development is in line with this goal.

8.9 National Ports Plan 2016

Reference is made to the National Ports Plan 2016 (Source: http://www.transnetnationalportsauthority.net/Infrastructure%20and%20Port%20Planning/Documents/NPP_2016_PDFP%20DOCUMENT.pdf). Refer to **Appendix I** for an extract.

New plans for Maritime Engineering include a Floating Dry Dock facility in Richards Bay and increased land use in Saldanha Bay, Port Elizabeth and Cape Town has been identified in the National Ports Plan.

The proposed project therefore is in align with this plan.

9. NEED AND DESIRABILITY

Richards Bay is the largest deepwater port in Africa, and handles the bulk of South Africa's exports.

The Port of Richards Bay serves the hinterlands of Northern KwaZulu-Natal, Gauteng and Mpumalanga. The Port of Richards Bay is the largest in South Africa, handling about 41% of South Africa's total cargo demand. Operations in the Port focus mainly coal exports, dry bulk, break bulk and liquid bulk. Other services include bunkering, ship repairs and facilities for service and recreational craft.
The need and desirability of any development must be considered in terms of ecological sustainability as well as the promotion of justifiable economic and social resources.

As the Port of Richards Bay is located in an estuarine bay, an estuarine impact assessment was undertaken by MER (refer Appendix F). The study indicated that the development would have direct and indirect impacts on habitat, benthic macroinvertebrate fauna, ichthyofauna and avifauna in Richards Bay. A number of potential impacts cannot be effectively or fully mitigated given the nature of the project. However, the proposed site was not found to support any rare or particularly productive estuarine habitats or faunal communities. Overall there may be localised residual impacts of medium significance but this would not be anticipated to substantially impact on the health of the system.

Reference is made to Operation Phakisa. Extracts are included in Appendix I. Approximately 300 million tons of cargo moves through South African Ports in imports and exports. Approximately 1.2 million tonnes of liquid fuels move along the South African coast. South Africa is well located to serve the East-West cargo traffic and the booming African offshore oil and gas industry, through marine manufacturing, which includes ship and rig repair, refurbishment and boatbuilding. Currently South Africa capture only 1% of the global market of ship repair and refurbishment.

This initiative will see an expansion of the South African Port's capacity for repair work for oil ships and oil rigs. Some of the initial targets are:

- An increase in the local manufacturing capacity through a ten % increase in the usage of local components for boat and ship building.
- An increase in the ship repair capacity in Richards Bay, thus creating two hundred (200) direct jobs.
- To create a dedicated occupational team for the sector within the Department of Higher Education and Training to drive alignment between theoretical and workplace learning.
- Increasing the amount of minerals exported on South African ships, which will create more than four thousand direct jobs.

The development is furthermore in line with KZN's Provincial Growth and Development Strategy. Refer to Appendix I for an extract. Strategic Objective 4.1 refers to the Development of seaports and airports. The ports of KZN operate at optimal capacity and offer greater potential to increase connectivity both at domestic and international level.

Reference is made to the uMhlathuze Local Municipality's IDP (http://www.umhlathuze.gov.za/images/IDP.pdf). An extract is attached in Appendix I. The IDP states that harbour development has provided the drive for large-scale industrial growth. This is seen as an opportunity in terms of uMhlathuze's SWOT analysis (strengths, weaknesses, opportunities, threats). The development of the marine infrastructure that will support a Floating Dry Dock will attract ships normally going to Durban for repairs to Richards Bay. The development is therefore in line with the IDP as it will lead to growth. Another goal of the Municipality is to have Viable Economic Growth and Development and job creation and this development is in line with this goal.

TNPA have also identified the need for the development in their National Ports Plan of 2016. (Refer to Appendix I for an extract).

10. MOTIVATION FOR THE EXPANSION OF EXISTING REPAIR QUAY AND RELATED MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

The State President launched Operation Phakisa on 8 July 2014 that forms part of the Oceans Economy and is a key driver for job creation and economic growth for South Africa. Operation Phakisa is designed to fast track the implementation of solutions to critical development issues. The Oil, Gas and vessel repair sector represents a huge untapped opportunity to attract sustainable business opportunities to the South African Ports.

A number of initiatives (18 in total) were identified within the Phakisa Marine Transport and Manufacturing Laboratory. This development falls within initiative 7 – to implement strategic prioritised project in the Port of Richards Bay. The development furthermore also forms part of the National Ports Plan and is aligned with the KZN Provincial Growth and Development Strategy.

The majority of vessels that enters the Port of Richards Bay are dry bulk vessels and they range from Panamax to mini Cape size and Cape Size vessels. The sizes of these vessels ranges between 221 to 250m and 251 to 310m respectively.

Currently the existing repair quay and basis depths range from -8m Chart Datum to -9 Chart Datum.

Handymax and Panamax vessel class range vessels can easily be accommodated in the Port of Durban and Cape Town but Cape size vessels cannot be accommodated in South African ports as a result of the limited dry dock dimensions at these ports.

The most common Length Overall (LOA) of the Cape-size vessel class calling at the Port of Richards Bay is from 286m to 290m and 291m to 295m with 98 vessels and 65 vessels calling per annum respectively.

The graphs in the figure below show a comparison of the demand and future capacity for each bulk cargo type in the Port of Richards Bay. The information provided in the figures below does support an outlook of increased future vessel calling at Port and the possibility of an increased number of Cape Size vessel callings.

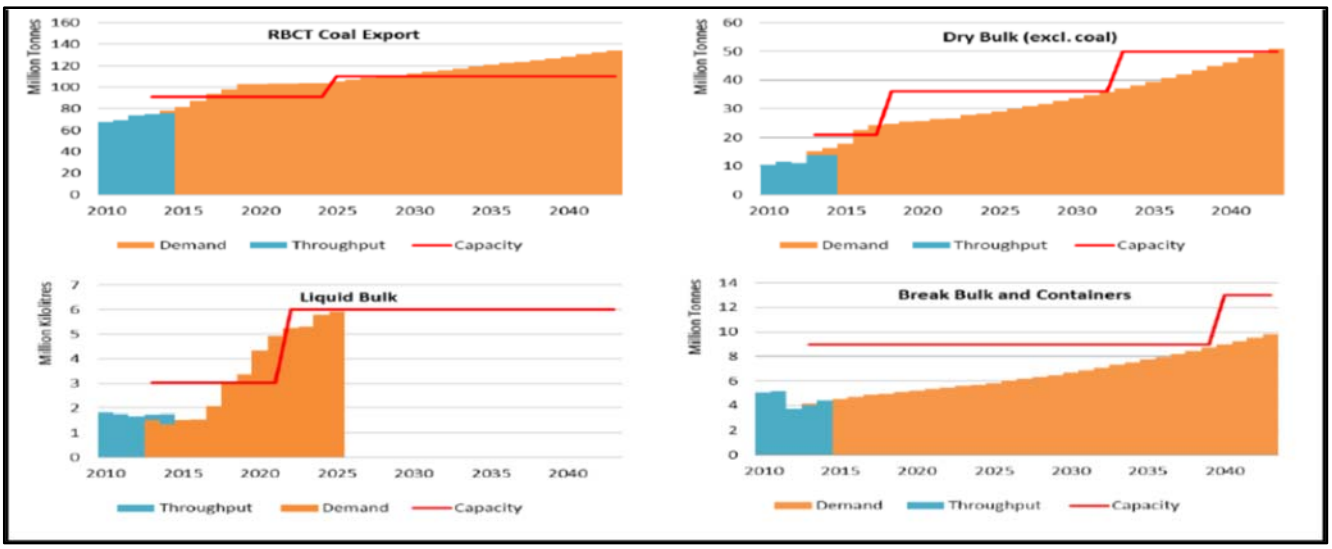

Figure 2: Demand of bulk cargo

The grand total of vessels entering the Port in September 2017 was 142 with a total tonnage of 6 238 329. The marine infrastructure is therefore required for the operation of a floating dry dock otherwise this new market will be serviced elsewhere.

The Sub-Sharan African countries marine activities have also created a demand for ship repair services.

Currently an estimated 13 000 ships call at South African Ports every year and over 30 000 vessels sail along the South African coastline on an annual basis. A ship repair facility can therefore be a thriving and growing industry but this opportunity is currently missed.

The development will therefore provide the necessary marine infrastructure required for the operation of a Floating Dry Dock that is required as per Initiative 7 of Operation Phakisa.

This in turn will result in the following secondary positive impacts:

- Potential for marine revenue benefits;
- More business will be attracted with the introduction of the Floating Dry Dock;
- The Floating Dry Dock will be utilised for the annual maintenance of the Port tuck and pilot boats. Currently the boats have to sail to Durban for annual maintenance. The Port will therefore save costs on fuel, labour, time and transportation.
- Creation of more jobs (i.e. Millwrights, Electricians, Fitters, Riggers, Plumbers, Crane Operators, General Workers, Technicians and etc.) during both construction and operation.

The Port is expected to expand in future and the number of vessels calling to the Port of Richards Bay will also increase. Therefore it is expected that, there will be more vessels requiring maintenance / repairs and the proposed Floating Dry Dock will be utilised for that function.

11. DETAILS OF ALTERNATIVES CONSIDERED

11.1 Site alternatives

It was not considered necessary to investigate site or location alternatives as the proposed site already has an existing repair quay that will be expanded and, if approved, will assist in providing marine infrastructure for a Floating Dry Dock. Furthermore given that the area that is proposed already has an existing repair quay and that the intention of the proposed project is to provide marine infrastructure for the operation of a Floating Dry Dock, in support of the proposed Ship Repair Facilities at the Port, no other land use alternatives were considered.

11.2 Alternatives for disposal of dredged material

Two options was considered for the disposal of the dredged material. WSP Environmental Pty) Ltd was appointed to assess whether the dredged material can be disposed of offshore or terrestrially. The findings of their study was that the dredged material was non-hazardous and disposal could be either offshore or terrestrially. Approximately 1.4 million m3 of dredged material will need to be disposed of and as a result of this volume the preferred alternative is to dispose of it offshore. TNPA has an existing disposal site that covers an area of approximately 1.7 million m^2. Currently TNPA has a maintenance dredging permit (Permit no 06/2017) in place to dredge a volume of 1.2 million m^3 that expiries in March 2018. An application for a new dredging permit will therefore be required. The Oceans and Coastal Branch of Department of Environmental Affairs is being consulted with in this regard.

11.3 No-go alternative

In terms of the No-Go Alternative, the existing repair quay would not be expanded in support of the proposed Ship Repair facilities (Floating Dry Dock) at the Port. TNPA's tug boats would continue to sail to Durban for annual maintenance. The Port of Richards Bay would therefore not save costs on fuel, labour and transportation as the tug boats will continue to be serviced in Durban as there will not be a facility available for a Floating Dry Dock. Larger ships would continue to be turned away as the facilities will not be available/adequate for repairs. Furthermore the existing Dormac Floating Dry Dock in Durban would continue to be under pressure to service larger vessels. Additionally Cape size vessels will also not be able to be serviced as there will be no facilities for a Floating Dry Dock able to provide this service to vessels of such a size in South Africa. This will result in lost opportunity to the South African Ports as there would be no facility available to service ships of this size. The Applicant will furthermore fail in terms of the initiative that has been identified as part of Operation Phakisa. No significant benefits associated with the No-Go Alternative have been identified. No environmental risk factors were determined which should prevent the proposed expansion of the repair quay and associated infrastructure at the Port of Richards Bay.

12. DESCRIPTION OF THE PHYSICAL ENVIRONMENT

12.1 Geographical

The Port of Richards Bay is located approximately 160 km North-East of Durban and 465 km South of Maputo on the eastern seaboard of South Africa. The port occupies 2,157 ha of land area and 1,495 ha of water area. The entrance channel is dredged to a permissible draught of 17,5m with a -19,5m depth in the entrance channel.

The layout of the Port can be seen in **Figure 2** below as well as the location of the existing repair quay.

Figure 2: Layout of the Port of Richards Bay as well as location of existing repair quay

12.2 Climate

Richards Bay has a warm to hot and humid subtropical climate, with warm moist summers. Average daily maximum temperatures range from 29°C in January to 23°C in July. The Mean Annual Precipitation (MAP) is 1 228 mm and most of the rainfall occurs in the summer months (from October to March). Early summer rainfall is derived mainly from deep convective showers and thunderstorm with occasional hailstorms. Late summer rainfall is less severe with more widespread convective activity associated with sub-tropical easterly circulation patterns. The annual average rainfall for the region is 1228 mm per year. Rain peaks in late to mid-summer, in January and February, but is also likely to receive rain all year round.

Tropical cyclones and middle-latitude systems have resulted in extreme rainfall events on several occasions and pose a risk to infrastructure within Richards Bay. However, middle latitude frontal system can interact with the sub-tropical circulation to cause severe squall lines of thunderstorms that produce torrential rainfall. Winter rainfall generally occurs in association with middle-latitude frontal weather systems (EMF for the Richards Bay Port and Industrial Development Zone Area – Status Quo Report (October 2009).

Winds are predominantly north easterly or south westerly during the day with a combined frequency of occurrence of 24%. The north easterly (thermal) wind is associated with high pressure systems and fine weather and the south westerly winds that are associated with westerly waves are cold, frontal weather. There is a decrease in the frequency of north easterly winds at night when the southerly winds increase in frequency and occurring 19% of the time as part of the land-sea. More calm conditions (winds less than 1 m/s) occur at night than during the day. The diurnal variation in airflow over the region is influenced by the land sea breeze circulation and topographically induced effects winds.

12.2.1 Air Quality

Reference is made to the Air Quality Study undertaken by WKC attached in **Appendix F**.

The area incorporates various forms of commercial, light and heavy industrial activities including coal terminals and port activities, aluminium smelters, a kraft process paper mill, a phosphoric acid fertilizer plant, a minerals refining plant and a number of smaller chemical and mechanical processors.

Sensitive receptors are:

- KNK Curries and surrounding retail outlets
- Dros and surrounding restaurants
- Cubana
- Meerensee residential area
- Richards Bay Port Area Entrance
- Protected area / bird area

Data from the RBCAA's CBD monitoring station for the period January 2009 to August 2013 was reviewed. The station is situated 4km north east from the proposed development. It is therefore the closest station providing ambient air concentrations of the pollutant PM_{10} and located along the dominant wind direction axes. The data availability of the parameters recorded at this station for the period is 98%.

The figure below provides data on the baseline or pre-development conditions for the project area.

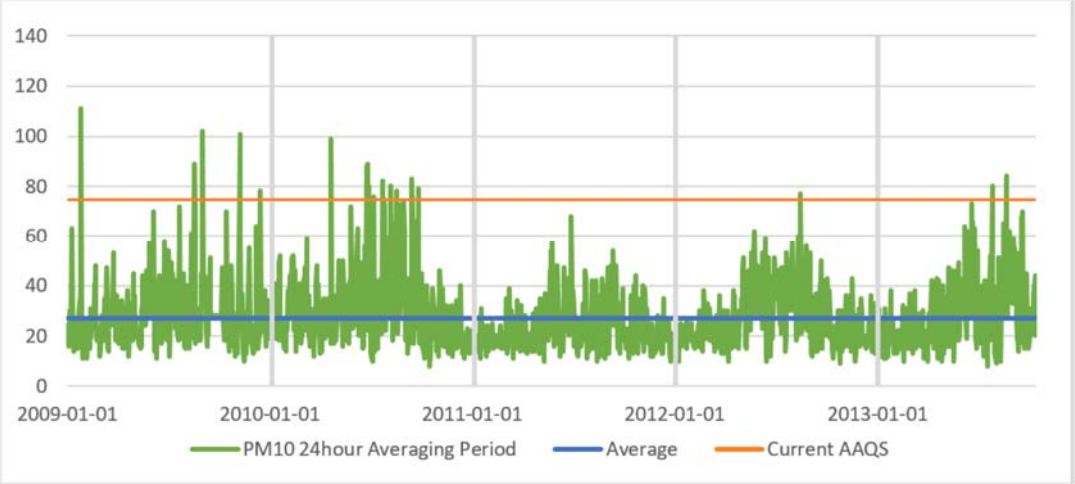

Figure 3: PM10 24 Hour Ambient Air Quality Data (2009-2013)

The average ambient concentration of PM10 for the period has been calculated as 27 µg/m3, representing the annual average for the CBD station. At the time of the recording of the presented data, the AAQS was 120 µ/m3, and no exceedances of the AAQS were recorded. However, in terms of the new and current AAQS, there were several exceedances of the 24-hour averaging period standard (75 µ/m3)>. There were five (5) exceedances in 2009, nine (9) exceedances in 2010, one (1) exceedance in 2012 and two (2) exceedances in 2013. In terms of the national AAQS, only four exceedances of the standard are permitted per annum. The purposes of the assessment (based on the IAQM assessment methodology), the annual average of 27 µg/m3 was used to inform the impact assessment.

12.3 Geology and Soils

The Port of Richards Bay is underlain by Cretaceous Siltstone bedrock of the St. Lucia Formation beneath younger, largely unconsolidated aeolian and estuarine deposits (Protekon, 2005). The geology across the port area can be broadly classified as follows:

Stratum	Sub-Group	Period
Beach and dune sands	Recent Deposits	Quaternary (Holocene)
Sands, silts and clays	Harbour Beds	Quaternary (Upper Pleistocene to Holocene)
Limestone and calcarenite	Uloa Formation	Tertiary (Miocene to Pliocene)
Siltstone	St. Lucia Formation	Cretaceous (Coniacian) to Tertiary (Palaeocene)

The Cretaceous Siltstone is encountered at depths of approximately -10m CDP to -12m CDP across the immediate study area. The Cretaceous Bedrock classifies as very soft rock, with no meaningful strength gain with depth (Protekon, 2005). Protekon (1998) note that the siltstone generally displays the properties of a highly over-consolidated soil rather than those more commonly associated with rock. The Harbour Beds, which are observed to overlie directly onto the Cretaceous Siltstone, consist primarily of sands, with some occurrence of silts.

12.4 Topography, Drainage and Watercourse/Estuary

Reference is made to the Estuarine Assessment prepared by MER (dated August 2017) attached in **Appendix F**.

Richards Bay is a marine dominated embayment with a deep wide mouth, large tidal prism and limited freshwater input via inflowing canals (Weerts 2002; DEA 2017). Estuarine bays are the major areas along South Africa's coastline that can support open intertidal mud flats, sandbanks and mangrove habitats.

Historically the existing Richards Bay estuary and the adjacent uMhlathuze estuary to the south was a single estuarine bay. During the 1970's the southern third of the Bay was separated off through the construction of a four kilometre long berm (Begg 1978; City of Umhlathuze 2010; DEA 2017) and set aside for formal conservation purposes allowing port development to continue in the bay in isolation from what became known as "The Sanctuary" area.

The classification as an estuarine bay remains (Whitfield 2000; Whitfield & Baliwe 2013), although a large open connection with the sea is now maintained by breakwaters. It is one of two estuarine bays in KwaZulu-Natal and only three in South Africa (together with Durban Bay and Knysna). Richards Bay is therefore significant in terms of its zonal type rarity at a local, regional and national scale, despite significant habitat loss and modification as a result of on-going harbour development (Turpie & Clark 2007; City of Umhlathuze 2010; DEA 2017).

Since 1976 the Port of Richards Bay has become South Africa's most modern and largest cargo handling port. Historical data suggest that the bay continues to function as an estuary of high biodiversity value supporting intertidal and shallow subtidal mudflats and sandbanks, deep water basins and channels, reed and mangrove swamps alongside traditional port infrastructure. The bay continues to support representative examples of almost all estuarine habitats found in South Africa's subtropical estuaries are (Vivier & Cyrus 2009a; Forbes, Demetriades & Cyrus 1996; Weerts 2002).

12.5 Flora

Reference is made to the Estuarine Assessment prepared by MER (dated August 2017) attached in **Appendix F**.

Estuarine bays are the major areas along South Africa's coastline that can support open intertidal mud flats, sandbanks and mangrove habitats. Although these habitats are relatively small features in the Richards Bay estuary, they typically support a high diversity and biomass of invertebrate fauna as well as high primary productivity in terms of benthic microalgae. These provide the basis of productivity at higher tropic levels that add to the biodiversity in the estuary.

12.5.1 Mangroves

Mangroves only occur in South Africa in estuaries that are a sheltered marine environment. The white mangrove *Avicennia marina*, the black mangrove *Bruguiera gymnorrhiza* and the red mangrove *Rhizophora mucronata* occur both in the Richards Bay and uMhlathuze Estuaries., The distribution and abundance of mangroves has changed significantly since construction of the port started in 1970 with major removal in the western area of the port, and subsequent (re)colonization of some areas (MER 2013). The largest individual *B. gymnorrhiza* and *R. mucronata* were found in the port at the 54 ha eChwebeni Reserve Heritage Site adjacent to the coal terminal – a remnant mangrove forest that may be the oldest known in Africa (Rajkaran & Adams 2011; van Niekerk & Turpie 2012).

Mangrove habitats consist of more than just trees; Thefauna associated with mangroves, particularly the invertebrates, is richer in mature stands which are characterised by large trees. The broader significance of the mangrove habitat is therefore linked to mature stands such as those within the eChwebeni Reserve Heritage Site.

In addition to the true mangrove species already mentioned, the fern *Acrostichum aureum,* and tree *Hibiscus tiliaceus* are mangrove-associates that do occur within and on the landward margin of the mangroves.

12.5.2 Salt marsh

Salt marsh communities in Richards Bay previously supported *Sarcocornia natalensis, Juncus kraussii, Sporobolus virginicus, Paspalum vaginatum* and herbs such as *Apium graveolens*, as well as *Salicornia pachystachya*. Surveys undertaken in 1998 indicated that salt marsh habitat was reported to be on a trajectory of decline.

12.5.3 Swamp forest

Swamp forests dominated by *Barringtonia racemosa, Hibiscus tiliaceus* and *Ficus trichopoda* occur in small dense stands along rivers, drainage channels, and the upper portions of the bay. Urban development in the bay and surrounding environment has severely impacted on these communities.

12.6 Fauna

The most critical estuarine functions of the bay have been identified as:

- *providing habitat for resident and estuary-dependent crustaceans and fish that use the system as a nursery area (Weerts, Cilliers & Cyrus 2003),*
- *supporting important populations of fish, including numerous species of commercial importance (Weerts et al. 2003).*

12.6.1 Benthic macroinvertebrates

The benthic macroinvertebrate community in an estuary can strongly influence the abundance and species composition of tertiary consumers (MacKay 2006a). The estuarine invertebrates of Richards Bay are associated with a variety of habitats within the estuary viz:

- Supratidal beaches,
- Intertidal sand and mud banks/beaches,
- Mangroves and swamp forest,
- Subtidal sand and mud.

Finer sediments with raised organic content is common to intertidal and subtidal sand and mudbanks *Coarser substrates tend to have a relatively poor nutrient status and are characteristic of unstable conditions resulting in a low diversity and abundance of benthic fauna.*

Richards Bay is recognised as an important nursery area, particularly for estuary dependent commercially important prawn species (De Freitas 1986, Weerts et al. 2003, Cyrus and Forbes 1996; MER 2013). These include the penaeid prawns Metapenaeus monoceros, Penaeus japonicus and Penaeus indicus, and the mangrove crab Scylla serrata, all of which have an obligatory estuarine phase in their lifecycles. M. monoceros and P. indicus have been shown to have a strong preference for muddy mangrove areas, while M. japonicus preferred subtidal sandflats. The species richness of prawns and crabs was considerably higher in the Kabeljous Flats than the Mhlathuze Estuary sanctuary to the south (MER 2013). Fifteen prawn species, twelve true crab species, two hermit crab species and one mantis shrimp species have been recorded (Vivier & Cyrus 2009b). Two macroinvertebrate species endemic to South Africa have been recorded in the bay, the burrowing mud crab, Paratylodiplax blephariskios and the carid prawn Palaemon peringueyi. P. blephariskios has been linked to muddy substrata, while the estuarine migrant P. peringueyi is usually associated with the seagrass Zostera capensis (Forbes and Cilliers 1999). However, given the apparent loss of the once extensive beds (MER 2013) the state of the P. peringueyi population is unknown.

The importance of the Kabeljous Flats for the benthic macroinvertebrate community has been emphasized in previous reports (CSIR 2005, Weerts et al 2008, CRUZ 2009 a, b, c). This area supports a variety of aquatic habitats, including ca. 440 ha of intertidal and subtidal mud- and sandbanks (CRUZ 2009c). The most complete and detailed description of the benthos of this area is contained in the reports by MacKay (2006a, 2006b). These reports describe a diverse benthic fauna with 61 species recorded in 2003, 22 species in 2005 (CRUZ unpublished data) and 113 species in 2006. Similar diversity was recorded over this period by Forbes & Demetriades (2003, unpublished data).
In recent decades the lake St Lucia estuary has been largely closed to the sea and Richards Bay has been progressively developed through port establishment and expansion. As a result of the unavailability of these prime nursery grounds for prawns and estuary dependent fish the shallow water prawn fishery on the Thukela Bank has collapsed (MER 2013) and recruitment into the marine populations of Natal stumpnose strongly reduced (Mann & Pradervand 2007). It can reasonably be inferred that other species with similar life history strategies will also have been affected. The continued function of nursery habitat in Richard Bay is therefore considered important at a provincial level to the maintenance of offshore fish and prawns stocks.

12.6.2Ichthyofauna

Since 1996 the importance of Richards Bay to regional fish populations has been highlighted in a number of surveys. Approximately 53 species has been recorded in mangrove areas on the south-western edge of the Kabeljous flats. *Weerts (2002) reported 64 species of juvenile fish, of which 41 were sampled in subtidal mudflats, 32 on subtidal sandflats, 24 in mangroves and 26 in the Bhizolo Canal. Weerts and Newman (2009) listed 49 fish species, of which 45 were associated with sandbanks, 44 with mudflats and 27 with mangrove habitats.* The bay is ranked as 5th highest among 72 estuaries for fish species diversity with a total of 80 recorded species according to a comparative study on KZN estuaries undertaken. *In all cases a substantial proportion of the records were for estuary dependent species (as defined by Whitfield (1998)), including endemic and endangered species. This once again emphasises the significance of the bay as a regionally important nursery ground, particularly intertidal and shallow subtidal habitats.*

12.7 Avifauna

Although the adjacent uMhlathuze Estuary has been identified as an Important Birding Area (IBA) the bay supports most of the species identified as triggers for IBA status (Birdlife 2015), including regionally threatened species are pink-backed pelican Pelecanus rufescens, great white pelican Pelecanus onocrotalus, Caspian tern Sterna caspia, and the mangrove kingfisher Halcyon senegaloides,

A recent comprehensive assessment of the aquatic avifauna of Richards Bay was done by Allan (2009). Approximately 1,230 birds representing 24 species were recorded during a one-day survey during spring tide. *These were dominated by curlew sandpipers Calidris ferruginea, grey plovers Pluvialis squatarola, Terek sandpipers Xenus cinereus, greater sand plovers Charadrius leschenaultii, common whimbrels Numenius phaeopus and eight species of terns. Several waterbird species roosting on sand spit habitats were identified as Red Data Listed species and / or were associated with the international Ramsar and Bonn Conventions.*

More than 80% i.e 109 of the 135 waterbird species occurring in South Africa have been regularly recorded at Richards Bay. *Richards Bay was among the highest ranked estuaries for waterbird conservation in an analysis of 42 systems nationally, ranking as 3rd most important for abundance, 3rd for conservation value, 2nd on the endemism index and 1st for population size (Turpie 1995).*

The most important and potentially sensitive birds to port expansions are the migratory waders which move south from Europe and Asia during the boreal winter and for whom intertidal sand and mudflats are critical feeding habitat. This contributed to the identification of the system as a globally significant Important Birding Area, more recently re-assessed to be of Sub-regional importance (Marnewick, Retief, Theron, Wright & Anderson 2015). These represented 27 (> 24%) of the 109 species regularly recorded (Allan 2009). These species are critically dependent on either shallow wetlands or sheltered intertidal sand and mudbanks, i.e. estuarine environments. There are still substantial areas in the Bay that provide this combination and Richards Bay together with the Mhlathuze estuary therefore represent an area of major significance on the KZN coast as far as migrant waders are concerned.

13. DESCRIPTION OF THE SOCIO- ECONOMIC ENVIRONMENT

Reference is made to the uMhlathuze IDP 2012-2017 (http://www.umhlathuze.gov.za/docs-umhlathuze/idp/idp2012-2017.pdf).

13.1 General Socio-Economic Characteristics of the Area

The City of uMhlathuze (KZ 282) is situated on the north-east coast of the province of KwaZulu-Natal, approximately 180 kms north-east of Durban. The uMhlathuze area covers 796m^2 incorporating Richards Bay, Empangeni, eSikhawini, Ngwelezane, eNseleni, Felixton and Vulindlela, as well as the rural areas under Amakhosi namely, Dube, Mkhwananzi, Khoza, Mbuyazi and Zungu. The population is estimated at 325 000 of which 50% is rural and 50% urban. The city borders a coastline that spans approximately 45km's in length of which nearly 80% of it is in its natural state. The N2 highway traverses uMhlathuze Municipality in a north-east direction towards the Swaziland border and south-west towards Durban.
The City of uMhlathuze has an estimated 349 576 total population and about 82 972 households. This makes the average household size 4.2 persons per household.

The age category with the highest population is between the ages of 20-24 placing huge demands for social and economic opportunities. Youth (15-35 years) makes up 41.6% (137 622) of the people of uMhlathuze. The age group 65 years and above, 8 840 (2.7%) depends on social grants for sustenance.

13.2 Economy and contribution to GDP

Richards Bay's economy grows at an average rate of 4,3% per annum. The Port of Richards Bay is one of the two largest and busiest Ports in Africa creating a drive for the area to be one of the major industrial investment opportunities. The Port plays an important economic role not only for the KZN Province but also for the entire South Africa.

The City of uMhlathuze is a district node and dominant commercial centre in the uThungulu District providing economic opportunities for the town and surrounding areas. The key feature of uMhlathuze Municipality is the N2 Development Corridor, eThekwini-Ilembe-uMhlathuze Corridor.

The area is the third most important in KZN in terms of economic production, contributing 16.7% to national Gross Domestic Product (GDP) whilst also the third most important primary manufacturing area in KwaZulu Natal (KZN) in terms of economic production. Manufacturing is highly specialized export orientated, largely concentrated on basic iron and steel, paper and printing as well as food and beverages. The large scale industrial strengths of the uMhlathuze centre comprise of a varied industrial base of coal terminals and aluminium smelters, a number of industries including mining companies and paper mills, forestry, production of materials handling equipment, as well as fertiliser and special chemicals production.

13.3 Noise

A Noise Impact Assessment were undertaken by WKC (report attached in Appendix F).

Noise measurements were conducted at the nearby Sensitive Receptors (refer to **Figure 3** below) to establish the existing noise conditions.

Figure 3: Location of sensitive receptors

The day-time noise levels recorded during the survey are all below the applicable SANS day-time noise limits of 70 dB (A) for industrial areas and 50 dB (A) for suburban areas, with the exception of Sensitive Receptors 1, 2 and 7.

The noise levels recorded at Sensitive Receptors 1, 2 and 3 were considered to be consistent and representative of continuous ambient noise levels, with the primary sources of noise being the maintenance, cleaning and general repair quay operations / activities at the Project site and docked boats.

The study have indicated that Phase 1 construction noise activities would result in an exceedance of the construction noise threshold at Sensitive Receptor 1. The restaurants located at this location all face north east and are likely to screen the noise from patrons, this result reflects the worst-case scenario where construction activities take place at the boundary of the project site, adjacent to SR1. Phase 2, Phase 3 and Phase 4 construction activities will all be compliant with the construction the noise threshold.

The exceedance anticipated at SR1 during Phase 1 construction is as a result of the proximity of SR1 to the construction site where an exceedance (of the construction noise threshold) of approximately 2 dB is anticipated. In addition to the normal construction phases, a worst-case scenario of night time noise dredging was assessed. The assessment results indicated that noise levels arising from night-time dredging are not likely to result in exceedances of the night-time construction noise thresholds at any of the sensitive receptors.

13.4 Traffic

Nako Iliso conducted a traffic impact assessment to determine the traffic implications of the proposed development on the existing transport system.

The morning and afternoon peak hour traffic volumes taken indicated that most traffic occur westbound and eastbound along the R619 in the morning and afternoon peak. Traffic from the Transnet access roads is substantially lower.

The Transnet Northern and Southern intersections operates at an acceptable level of service for both the morning and afternoon peak hours. The southern intersection however during morning peak hour operates at an unacceptable level of service due to the high traffic volumes travelling eastbound. The northern and southern legs contribute to approximately 54 and 9 vehicles respectively, of the total traffic volume of the intersection. The overall performance of both intersections operates at an acceptable level of service (Deemed to be level of service D or above).

13.5 Cultural/Historical Environment

Reference is made to the Underwater Heritage Impact Assessment prepared by Vanessa Maitland conducted (report dated 17 August 2017).

The area around Richards Bay has been utilised since the Earlier Stone Age. The only sites that have been recorded in the area include several Earlier, Middle and Later Stone Age sites that are unfortunately now only scatters. There are also some Early and Late Iron Age settlements. The sites are seen as scatters due to previous development of the area (Anderson 2009; 2010).

Lt James Saunders King and Nathaniel Isaacs, early settlers, investigated the possibility of using the lagoon as a harbour for trade with the Zulu's during the 1920s and 1930s. The area was popular for hippo and crocodile hunts before the Anglo-Zulu War of 1879. This war also provided a motivation to the idea of a harbour, in order to bring in military supplies.

The lagoon was renamed Richards Bay after a survey of the coast was undertaken by the British Royal Navy. The name was garnered from Commodore F.W. Richards who apparently endorsed the survey.

There was renewed interest after the discovery of coal in the 1890s near Mzingazi Lake. However, these deposits were never fully developed and the British government decided to hand Zululand over to Natal, who was more interested in developing Durban Port.
During the South African War of 1899-1902, the idea of a port was once again mooted. Richards Bay was considered to be the best location as it offered the shortest, straightest line from the coast to the old Transvaal. The port plans were however shelved again following political unrest in 1907.

A number of commercial fisheries started working in the area, and once again a harbour, in the form of a fishing harbour was brought up during the 1900s. The fish yield declined by the 1930s and in the mid 1940's the Parks Board took over management of the area.

The area became a favourite amongst holiday makers after World War II. In the 1950s, the reed marshes around the lagoon were drained via canals in order to create new areas for sugar cane causing the gradual silting up of the lagoon. In 1965, the then minister of Transport announced a new harbour development for the lagoon. An oil pipeline was constructed in 1969 transporting oil to the old Transvaal via Empangeni. Work on the harbour commenced in 1972.

14. PUBLIC PARTICIPATION PROCESS

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

The following process was undertaken as part of the Public Participation Process:

14.1 Notification of Interested and Affected Parties (I&AP's)

I&AP's and key stakeholders were notified via email on the 25th of January 2018. Proof of notification has been attached in Appendix E.

14.2 Site Notices

Site notices were placed around the vicinity of the site on the 25th of January 2018. Site notices were also placed at TNPA's permit office, the City of uMhlathuze as well as the Library. Proof of the placement of site notices has been attached in Appendix E.

14.3 Advertisements

A Zulu and English advert was placed in the Zululand Observer on the 25th of January 2018. Proof of advertisements has been attached as Appendix E.

14.4 Summary of the issues raised by Interested and Affected Parties to date

Table 5: Issues raised by I&AP's

Organisation	Contact Name	Issue Raised	Response
QS 200 Plus	Frans van der Walt	Requested whether an investigation of alternative locations was undertaken. Indicated that Casuarina site was not favourable at all.	Transnet have looked at the area around the Casuarinas but this site was ruled out as a no-go due to the environmental sensitivity of the area. Furthermore it made sense to extend and modify the existing repair quay – refer to attached aerial photograph.

Organisation	Contact Name	Issue Raised	Response
			A public meeting will be held and all registered stakeholders will be notified thereof. At this stage it is anticipated to be held towards the end of March – after we have released the draft BAR.
		He also queried whether the development will have an impact on passenger ships docking in the area.	Passenger ships that usually dock in this area have to obtain special permission from TNPA.

14.5 Draft Basic Assessment Report

Interested and affected persons (I&AP's) will be afforded a thirty (30) day comment period from the date of notification and receipt of the DBAR to provide comment on the DBAR. A register will be opened and will be attached to the final report. This will include the names, contact details and addresses of all people who submitted written comments, all people who requested their names be placed on the register as well as all organs of state which have jurisdiction in respect of the activity. A comments and response report will be drafted and attached to the final report.

14.6 Open day

An open day is anticipated to be held in March and all registered stakeholders will be notified of the details regarding the open day.

15. IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

The SiVEST Impact Assessment method, dated 28 July 2017 (**attached as Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

The following impacts have been identified:

15.1 Impacts on Biophysical Systems / Components

15.1.1 Estuarine

15.1.1.1 Habitat loss as a result of capital dredging

Capital dredging will result in the direct loss of habitat in dredged areas and adjacent shallow subtidal habitats where the slope will recede to achieve a natural angle of repose. This will alter the extent of low productivity deep subtidal habitat (increase), and moderately productive shallow subtidal habitat (decrease). Although over time natural deposition processes would result in progressive shallowing of the affected areas on-going maintenance dredging to retain this new configuration would make habitat loss effectively permanent.

Habitat loss as a result of capital dredging		
Environmental parameter	The continued development of the port makes it increasingly unlikely that there will be a medium to long term expansion of shallow subtidal or intertidal habitats in the bay.	
Extent	Local	
Probability	Definite	
Reversibility	Irreversible	
Irreplaceable loss of resources	The continued development of the port makes it increasingly unlikely that there will be a medium to long term expansion of shallow subtidal or intertidal habitats in the bay.	
Duration	Although over time natural deposition processes would result in progressive shallowing of the affected areas on-going maintenance dredging to retain this new configuration would make habitat loss effectively permanent.	
Cumulative effect	The replacement of sand banks with deep subtidal habitat will reduce overall estuarine productivity in the bay, however the affected areas are not particularly diverse or productive when compared against similar areas such as the Kabeljou Flats. Cumulative impacts were therefore considered to be low.	
intensity/magnitude	Medium	
Significance Rating	Medium negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	
Probability	4	
Reversibility	4	
Irreplaceable loss	2	
Duration	4	
Cumulative effect	2	
Intensity/magnitude	2	
Significance rating	**36 medium negative**	
Mitigation measures	No mitigation possible.	

15.1.1.2 Increased turbidity as a result of capital dredging

Maintenance dredging has been reported to result in turbidity levels of 54 NTU at the mouth (DEA 2017), which would equate to a ten-fold increase. Although the effects would be temporary given the diurnal (twice a day) turnover of water with tidal exchange, it is anticipated that the capital dredging would require weeks or months to complete and that operations would continue during daylight hours over this period.

Increased turbidity as a result of capital dredging		
Environmental parameter	Background turbidity levels at the site were low. Capital dredging for the establishment of the proposed dry dock would result in localised increases in turbidity during the construction / establishment phase.	
Extent	Given the regional importance of the bay and the likelihood that increased turbidity effects would affect 'upstream' and 'downstream' areas in the estuary and the marine environment, the extent of impacts was determined to be of regional importance.	
Probability	Definite	
Reversibility	It is anticipated that post-dredging turbidity levels would reduce to currently levels rapidly. However, some of the sediment transported by tidal or wind-driven currents within the estuary would be likely to be deposited in other parts of the bay. Impacts were therefore considered partially reversible.	
Irreplaceable loss of resources	The portions of the bay likely to be most affected beyond the proposed site would be where tidal currents would be significant enough to transport suspended sediments strongest, limiting influences to deep water channels that are already highly impacted by maintenance dredging and regular shipping activity. Sediment plumes may be significant enough to reduce habitat availability and connectivity for sensitive species by clogging filter feeding apparatus or through gill abrasion.	
Duration	Short-term	
Cumulative effect	Considering that the capital dredging would be concurrent with the current trend of increased maintenance dredging, cumulative effects were rated as medium.	
Intensity/magnitude	High	
Significance Rating	High negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	1
Probability	4	2
Reversibility	2	1
Irreplaceable loss	2	2
Duration	1	1
Cumulative effect	3	1
Intensity/magnitude	4	2
Significance rating	**60 high negative**	**16 low negative**

Increased turbidity as a result of capital dredging	
Mitigation measures	The implementation of best practice mitigation options included in the TNPA maintenance dredging management plan would reduce the intensity and therefore significance of impacts. However, given the urgency of implementation, options to limit dredging operations may be precluded. The post-mitigation rating above would only apply if dredging is only undertaken using least-impact techniques such as the clamshell dredger: • During slack tide and low tide periods; • At low to moderate excavations rates; • Using bubble net technology to prevent the transport of sediment to other part of the Bay and • Strict hopper loading management to avoid the loss of dredge spoil into the bay during transport. Should only some of the mitigation measures listed above be implemented, the significance would be reduced to medium.

15.1.1.3 Re-suspension of contaminated sediments during capital dredging

Inorganic contaminants, particularly heavy metals, may be bound to sediment particles that are re-suspended in the water column during dredging (MacKay, Kelbe, Simmonis & Cyrus 2003). This may result in increased bio-availability of toxic substances previously bound by the sediment with subsequent impacts on the health and productivity of estuarine biota. In the absence of sediment quality data at the proposed site it has been assumed that there is some level of contamination given that:

- the site is located adjacent to existing high traffic deep water channels,
- the beaches, intertidal and shallow subtidal habitats to the west of the site have been identified as depositional areas, and
- the deeper areas of the site were characterised by fine sediments, which are often associated with increased pollutant concentrations.

Re-suspension of contaminated sediments during capital dredging	
Environmental parameter	Aquatic ecosystems are highly susceptible to contamination from point source and diffuse discharges of anthropogenically-derived pollutants, as well as accidental spills of hazardous materials. The industrial nature of port operations presents a high risk of organic and inorganic contamination of water, sediment and biota (living tissue).
Extent	Regional
Probability	Definite
Reversibility	Partially reversible
Irreplaceable loss of resources	Marginal loss
Duration	Medium to long term

Re-suspension of contaminated sediments during capital dredging		
Cumulative effect	Low	
Intensity/magnitude	Medium	
Significance Rating	Low negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	1
Probability	4	2
Reversibility	2	1
Irreplaceable loss	2	2
Duration	1	1
Cumulative effect	2	1
Intensity/magnitude	2	2
Significance rating	**28 low negative**	**16 low negative**
Mitigation measures	Sediments at the proposed site must be tested for contamination by heavy metals, ammonia, cyanide, fluoride, hydrogen sulphide, organotin (tributylin) and total petroleum hydrocarbons (parameters with TWQRs for the natural marine environment). Should contamination be detected the best practice mitigation for turbidity management should be applied.	

15.1.1.4 Habitat loss as a result of mooring dolphins

This would result in the permanent loss of disturbed deep water habitat.

Habitat loss at mooring dolphins		
Environmental parameter	The establishment of access and mooring infrastructure will result in the direct loss of benthic habitat.	
Extent	The specifications for the mooring dolphins are unknown making habitat loss difficult to quantify, however the structures would be established within the proposed site.	
Probability	Definite	
Reversibility	Irreversible	
Irreplaceable loss of resources	No measurable loss of resources would be anticipated as the structures would be established following the deepening of the site by dredging, which would render this area largely barren.	
Duration	Permanent	
Cumulative effect	Low	
Intensity/magnitude	Low	
Significance Rating	Low negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	
Probability	4	

Habitat loss at mooring dolphins		
Reversibility	4	
Irreplaceable loss	1	
Duration	1	
Cumulative effect	1	
Intensity/magnitude	1	
Significance rating	**36 medium negative**	
Mitigation measures	No mitigation possible.	

15.1.1.5 Potential impacts on water and sediment quality

Potential contamination of the bay by hazardous substances.

Contamination		
Environmental parameter	Construction of the mooring dolphins would require the use of heavy plant and potentially hazardous substances such as concrete. These activities therefore pose a risk to water and sediment quality.	
Extent	Local	
Probability	Possible	
Reversibility	Partly reversible	
Irreplaceable loss of resources	Contamination of the water column may have implications for habitats outside the proposed site given the potential for the transport of contaminants by tidal and wind-driven currents. However, in the absence of particularly sensitive habitat in close proximity to the proposed site it is anticipated that dilution would naturally mitigate contamination impacts to some extent and that biophysical impacts would be marginal.	
Duration	Short term	
Cumulative effect	Port operations have undoubtedly resulted in the cumulative contamination of sediments in the bay as these settle out of the water column, and impacts are anticipated to increase with on-going expansion. The potential for sediment contamination associated with this activity was rated as medium	
Intensity/magnitude	Medium	
Significance Rating	Low negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	2	2
Reversibility	2	2
Irreplaceable loss	2	1
Duration	1	1
Cumulative effect	3	1

Contamination		
Intensity/magnitude	2	2
Significance rating	**36 low negative**	**16 low negative**
Mitigation measures	• As far as possible, components of the mooring dolphins should be pre-cast and floated to the proposed site for positioning. This would avoid unnecessary risks associated with handling hazardous substances at the proposed site. • A spill contingency plan must be developed to ensure that best practice remediation is immediately effected in the event of an incident.	

15.1.1.6 Construction noise and vibration

Noise and vibration impacts on estuarine fauna.

Construction noise and vibration		
Environmental parameter	Despite the high levels of disturbance associated with the dredging that would take place, fish are highly mobile and it is likely that they would continue to traverse the site. The use of a vibratory hammer and rock drill to drive the mooring dolphins into the bed of the estuary would result in levels of vibration and noise that may reach lethal levels for fish in the vicinity. While there may be similar impacts on invertebrates these activities would be conducted following the capital dredging and these communities would have largely been removed from the site and all areas within several hundred metres. There would be no direct risk to invertebrate fauna. Local avifauna would likely vacate this area of the bay during high intensity activities. Given the relatively limited community of fairly generalist species observed during the site survey, this would be unlikely to be highly significant. However, should these activities be conducted during the summer months roosting areas on local beaches and intertidal sand banks would be unavailable to the considerable population of migrant waders that utilise these habitats.	
Extent	Local	
Probability	Probable	
Reversibility	Completely reversible	
Irreplaceable loss of resources	Given that food resources in the vicinity of the site are relatively poor and that beaches and intertidal habitats are relatively small the impact on resources was considered marginal.	
Duration	Short term	
Cumulative effect	Low	
Intensity/magnitude	Medium	
Significance Rating	Low negative	
	Pre-mitigation impact rating	Post mitigation impact rating

Construction noise and vibration		
Extent	2	
Probability	3	
Reversibility	1	
Irreplaceable loss	2	
Duration	1	
Cumulative effect	2	
Intensity/magnitude	2	
Significance rating	**22 low negative**	
Mitigation measures	No mitigation necessary.	

15.1.1.7 Maintenance dredging impacts on benthic invertebrate communities

Maintenance dredging would result in the periodic loss and disturbance of local benthic macroinvertebrate fauna. The communities that re-colonise the site following the installation of the floating dry dock would likely be altered and would be similar to those that exist in other deep water channels in the bay. These sites were characterised by a low diversity and abundance of robust taxa tolerant of disturbance.

Maintenance dredging impacts on benthic invertebrate communities		
Environmental parameter	Maintenance dredging of the site and approach channel.	
Extent	Local	
Probability	Definite	
Reversibility	Given that maintenance dredging would certainly be required for the lifetime of the floating dry dock operations impacts have been rated as irreversible.	
Irreplaceable loss of resources	Marginal	
Duration	Permanent	
Cumulative effect	Given that the benthic communities characterising the site were found to be of low diversity and abundance, but that community composition would be detrimentally altered, cumulative impacts were rated as low.	
Intensity/magnitude	Medium	
Significance Rating	Medium negative	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	
Probability	4	
Reversibility	4	
Irreplaceable loss	1	
Duration	2	
Cumulative effect	2	
Intensity/magnitude	2	

Maintenance dredging impacts on benthic invertebrate communities		
Significance rating	**30 medium negative**	
Mitigation measures	No mitigation necessary.	

15.1.1.8 Maintenance dredging impacts on water quality

Maintenance dredging would have similar impacts on local water quality to capital dredging. The decreased volumes of sediment to be disturbed would generally result in a lower intensity of impact, however the likelihood of increasing contamination of sediments at the site as a result of the dry dock operations would increase the risk of re-suspension of contaminants.

Maintenance dredging impacts on water quality		
Environmental parameter	Maintenance dredging of the site and approach channel.	
Extent	Local	
Probability	Definite	
Reversibility	Given that maintenance dredging would certainly be required for the lifetime of the floating dry dock operations impacts have been rated as irreversible.	
Irreplaceable loss of resources	Marginal	
Duration	Permanent	
Cumulative effect	Given that the bay has been considered to have existing water quality impacts as a result of port operations, cumulative impacts were rated as medium.	
Intensity/magnitude	Medium	
Significance Rating	Medium	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	4	2
Reversibility	4	1
Irreplaceable loss	2	2
Duration	4	1
Cumulative effect	3	1
Intensity/magnitude	2	2
Significance rating	**38 medium negative**	**16 low negative**
Mitigation measures	Mitigation measures should follow best practice dredging operations	

15.1.2 Air

15.1.2.1 Dust soiling

Emission of dust / Dust soiling: dust deposition, resulting in the soiling of surfaces; and / or visible dust plumes, which are evidence of dust emissions

Dust soiling		
Environmental parameter	Environmental Amenity / Dust Soiling (of the environment)	
Extent	Local	
Probability	Possible	
Reversibility	Completely reversible	
Irreplaceable loss of resources	No loss of resource	
Duration	Permanent	
Cumulative effect	Short term	
Intensity/magnitude	Medium	
Significance Rating	High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	3	2
Intensity/magnitude	3	3
Significance rating	**30 medium negative**	**24 low negative**
Mitigation measures	Mitigation for all sites: Communications: • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. • Display the head or regional office contact information. Mitigation for all sites: Dust Management: • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. Site Management • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked.	

Dust soiling	
	• Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. Monitoring • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Preparing and maintaining the site • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. • Cover, seed or fence stockpiles to prevent wind whipping. Operating vehicle/machinery and sustainable travel • Although no specific mitigation measures are proposed for vehicle emissions, all vehicles and equipment will undergo regular maintenance, will be operated to manufacturers' guidelines. • Ensure all vehicles switch off engines when stationary - no idling vehicles. Where black smoke is observed, the equipment will be safely shut down and maintenance measures undertaken. • Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable. • Produce a Construction Logistics Plan to manage the delivery of goods and materials. Operations • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Dust soiling	
	• Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. Waste management • Avoid bonfires and burning of waste materials. Measures specific to earthworks • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Measures specific to construction • Avoid scabbling (roughening of concrete surfaces) if possible. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

15.1.2.2 Dust impacts on human health

Emission of dust: from: Increased emissions of PM10 has the potential to adversely affect human health.

Dust impacts on human health		
Environmental parameter	Human health	
Extent	Local	
Probability	Possible	
Reversibility	Completely reversible	
Irreplaceable loss of resources	No loss of resource	
Duration	Permanent	
Cumulative effect	Short term	
Intensity/magnitude	Medium	
Significance Rating	High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	3	2
Intensity/magnitude	3	2
Significance rating	**30 high negative**	**24 low negative**
Mitigation measures	Mitigation measures as per table above.	

15.1.2.3 Dust impacts on the ecological environment

Emission of dust: from: Increased emissions of dust has the potential to adversely affect the ecological environment.

Dust impacts on the ecological environment		
Environmental parameter	Ecological environment	
Extent	Local	
Probability	Possible	
Reversibility	Completely reversible	
Irreplaceable loss of resources	No loss of resource	
Duration	Permanent	
Cumulative effect	Short term	
Intensity/magnitude	Medium	
Significance Rating	High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	3	2
Intensity/magnitude	3	2
Significance rating	**30 high negative**	**24 low negative**
Mitigation measures	Mitigation measures as per table above.	

15.1.3Noise

15.1.3.1 Impact of noise on sensitive receptors

An increase in ambient noise levels at sensitive receptors by 7 or more dB(A).

Noise		
Environmental parameter	The ambient acoustic environment at sensitive receptors near the project site	
Extent	Two receptors are anticipated to be impacted from the construction activities within a local extent (up to approximately 1km)	
Probability	Probable	
Reversibility	Reversible	
Irreplaceable loss of resources	No loss of resource is anticipated	
Duration	Short term	
Cumulative effect	It is possible that the increase in noise levels may result in potential for cumulative negative impacts if concurrent activities take place (construction of other projects in the vicinity of the sensitive receptors)	
Intensity/magnitude	An increase in ambient noise levels of 7 dB(A) is considered a noise nuisance and a high significance impact.	
Significance Rating	Impact at the nearest sensitive receptors may be disturbing to shop / restaurant owners and patrons due to the anticipated increase in ambient noise levels during the day. Mitigation is recommended to reduce the impact at the most sensitive receptors.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	2
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	2	2
Intensity/magnitude	3	2
Significance rating	**30 medium negative**	**18 low negative**
Mitigation measures	Specific Mitigation Measures: • As far as possible, the noisiest construction activities should be undertaken away from SR1 (i.e. the western areas of the project site). The construction laydown areas should be located based on the same principle. • Site Hoarding should be erected along the project site boundary between SR1 and the construction activities especially where there is no direct noise screening afforded by existing infrastructure).	

Noise	
	• General Measure: General best practice guidelines for construction noise mitigation have been recommended as per Section 5.2 of the Noise Impact Assessment. It is anticipated that with effective implementation of these measure that the impact of construction activities on the acoustic environment at sensitive receptors will be mitigated to “Negative Low”

15.1.4Socio-economic

15.1.4.1 Job creation during construction

Job creation during the construction period		
Parameter	A number of jobs will be created during the construction phase of the project. At this stage the Applicant is unsure about the exact amount of numbers that will be created.	
Extent	Medium	
Probability	Definite	
Social value	High	
Importance to Quality of Life	High	
Duration	Short term	
Cumulative effect	High	
Intensity/Magnitude	High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	
Probability	4	
Social value	3	
Importance to Quality of Life	3	
Duration	1	
Cumulative effect	3	
Intensity/Magnitude	3	
Significance rating	**39 positive medium**	
Mitigation measures	No mitigation required.	

15.1.4.2 Provision of facilities for a ship repair facility

The marine infrastructure will provide the necessary infrastructure required for a ship repair facility

Provision of infrastructure for a ship repair facility		
Parameter	The marine infrastructure will provide the necessary infrastructure required for a ship repair facility	
Extent	Very High	
Probability	Definite	
Social value	Very High	
Importance to Quality of Life	Very High	
Duration	Permanent	
Cumulative effect	High	
Intensity/Magnitude	Very High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	4	
Probability	4	
Social value	4	
Importance to Quality of Life	4	
Duration	4	
Cumulative effect	4	
Intensity/Magnitude	4	
Significance rating	**96 positive very high**	
Mitigation measures	No mitigation required.	

15.1.5 No-go alternative

15.1.5.1 Loss of employment opportunities

Loss of employment opportunities		
Parameter	No jobs will be created	
Extent	Medium	
Probability	Definite	
Social value	High	
Importance to Quality of Life	High	
Duration	Short term	
Cumulative effect	High	
Intensity/Magnitude	High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	

Loss of employment opportunities		
Probability	4	
Social value	3	
Importance to Quality of Life	3	
Duration	1	
Cumulative effect	3	
Intensity/Magnitude	3	
Significance rating	**39 negative medium**	
Mitigation measures	No mitigation possible.	

15.1.5.2 No provision of infrastructure for a ship repair facility

No provision of infrastructure for a ship repair facility		
Parameter	Failure to provide the necessary marine infrastructure required for a ship repair facility	
Extent	Very High	
Probability	Definite	
Social value	Very High	
Importance to Quality of Life	Very High	
Duration	Permanent	
Cumulative effect	High	
Intensity/Magnitude	Very High	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	4	
Probability	4	
Social value	4	
Importance to Quality of Life	4	
Duration	4	
Cumulative effect	4	
Intensity/Magnitude	4	
Significance rating	**96 negative very high**	
Mitigation measures	No mitigation possible.	

16. POSITIVE AND NEGATIVE IMPACTS OF THE EXPANSION OF EXISTING REPAIR QUAY AND RELATED MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

A summary of the impacts pre-mitigation and post-mitigation are provided below:

Impact	Pre-mitigation	Post-mitigation
Expansion of Existing Repair Quay & Related Marine Infrastructure		
Habitat loss as a result of capital dredging	Medium negative	No mitigation possible
Increased turbidity as a result of capital dredging	High negative	Low negative
Resuspension of contaminated sediments during capital dredging	Low negative	Very low negative
Habitat loss as a result of supporting infrastructure	Low negative	No mitigation possible
Potential impacts on water and sediment quality	Low negative	Very low negative
Construction noise and vibration	Low negative	No mitigation possible
Maintenance dredging impacts on benthic invertebrate communities	Medium negative	No mitigation possible
Maintenance dredging impacts on water quality	Medium negative	Low negative
Dust soiling	Medium negative	Low negative
Dust impacts on human health	High negative	Low negative
Dust impacts on ecological environment	High negative	Low negative
Impacts on noise sensitive receptors	Medium negative	Low negative
Job creation during construction period	Medium positive	No mitigation required
Provision of infrastructure for a ship repair facility	Very high positive	No mitigation required
No-go Alternative		
Loss of employment opportunities	Medium negative	No mitigation possible
No provision of infrastructure for a ship repair facility	Very high negative	No mitigation

16.1 Mitigation measures

Refer to section 15 above. Specialist studies have informed the environmental issues and risks identified by the development. The assessment of each issue is included in Section 15 above and mitigation measures are provided for each impact identified.

17. SUMMARY OF SPECIALIST REPORTS

Environ. Parameter	Summary of major findings	Impact management measures
Estuarine	The proposed establishment and operation of the proposed dry dock would have direct and indirect impacts on habitat, benthic macroinvertebrate fauna, ichthyofauna and avifauna in Richards Bay. A number of potential impacts cannot be effectively or fully mitigated given the nature of the project. However, the proposed site was not found to support any rare or particularly productive estuarine habitats or faunal communities. Overall there may be localised residual impacts of medium significance but this would not be anticipated to substantially impact on the health of the system.	Mitigation measures are included under Section 15.1.1.
Air Quality	The worst-case potential impacts are considered to be of Negative Medium Impact. Medium impacts identified in terms of dust soiling, human health, ecological, dust soiling and human health are as of a result to the close proximity of Sensitive Receptor no 1 to the Project Phase 1 and Phase 4 construction earthworks (adjacent east). Similarly, the ecological impact is considered medium risk due to the proximity of Sensitive Receptor no 6 to the Project site (adjacent west).	Mitigation measures are included under Section 15.1.2.
Noise	The noise impact assessment findings were that Phase 1 construction noise activities would result in an exceedance of the construction noise threshold at Sensitive Receptor 1. The restaurants located at this location all face north east and are likely to screen the noise from patrons, this result reflects the worst-case scenario where construction activities take place at the boundary of the project site, adjacent to SR1. Phase 2, Phase 3 and Phase 4 construction activities will all be compliant with the construction the noise threshold. The exceedance anticipated at SR1 during Phase 1 construction is as a result of the proximity of SR1 to the construction site where an exceedance (of the construction noise threshold) of approximately 2 dB is anticipated. In addition to the normal construction phases, a worst-case scenario of night time noise dredging was assessed. The assessment results indicated that noise levels arising from night-time dredging are not likely to result in exceedances of the night-time construction noise thresholds at any of the sensitive receptors.	Mitigation measures are included under Section 15.1.3.
Traffic	The development is not expected to have an adverse impact on the road network within the study area from a traffic perspective, due to the development traffic having minimal impact to the road network.	No mitigation required.

Environ. Parameter	Summary of major findings	Impact management measures
Underwater Heritage	• There were no large magnetic anomalies that could point to a shipwreck, within the area surveyed. • From a heritage point of view, work can continue as long as the mitigation measures are implemented. • No impact on heritage sites, features or objects can be allowed without a valid permit from SAHRA's MUCH Unit.	• The Environmental Control Officer should be given a short induction, by the heritage practitioners, on archaeological site and artefact recognition. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).
Disposal of dredged materials	Interpretation of the analytical results has indicated that the intended dredging spoil is classified as non-hazardous and if disposed of terrestrially can be undertaken at an appropriately licenced Class C (GLB+) landfill facility. Given the non-hazardous classification, the preparation of a Safety Data Sheet is not necessary. Otherwise, with the exception of mercury within deposits recovered from depths of between 6m and 9m bgl, no contaminants were recorded at concentrations in excess of their Warning Level of the National Action List and, therefore, it is considered highly likely that the spoils are suitable for marine disposal subsequent to dredging. Nevertheless, the ultimate decision rests with the Oceans and Coasts branch of the DEA.	No mitigation measures required.

18. ENVIRONMENTAL IMPACT STATEMENT

The development forms part of Operation Phakisa. This initiative is designed to fast track the implementation of solutions to critical development issues. A number of initiatives were identified within the Phakisa Marine Transport and Manufacturing Laboratory. In particular Initiative 7 which focuses on developing a Ship Repair Facility (Floating Dry Dock) in the Port of Richards Bay.

The business interests of the development are:

- Potential for marine revenue benefits;
- More business will be attracted with the introduction of the Floating Dry Dock;
- The Floating Dry Dock will be utilised for the annual maintenance of the Port tuck and pilot boats. Currently the boats have to sail to Durban for annual maintenance. The Port will therefore save costs on fuel, labour, time and transportation.
- Creation of more jobs (i.e. Millwrights, Electricians, Fitters, Riggers, Plumbers, Crane Operators, General Workers, Technicians and etc.) during both construction and operation.

The Port is expected to expand in future and the number of vessels calling to the Port of Richards Bay will also increase. Therefore it is expected that, there will be more vessels requiring maintenance / repairs and the proposed Floating Dry Dock will be utilised for that function.

Currently an estimated 13 000 ships call at South African Ports every year and over 30 000 vessels sail along the South African coastline on an annual basis. A ship repair facility (Floating Dry Dock) can therefore be a thriving and growing industry but this opportunity is currently missed. Durban's ship repair sector is stagnating due to a shortfall of ship repair facilities available. Internationally accredited marine engineering company Dormac, which is one of the largest ship repair users of the Durban graving dock, has been finding it difficult to remain competitive in the absence of world-class facilities. According to Dormac they have turned away between four and seven vessels each month and estimates that the demand for ship repair at South Africa's busiest port exceeds supply sevenfold. Over the past year the floating dry dock in Durban have serviced just six vessels in Durban whereas 20 where serviced in Cape Town and most would have preferred to been serviced in Durban.

TNPA is proposing to extend and develop the existing repair quay in the Port of Richards Bay. The objective of this project is to provide marine infrastructure needed to accommodate a floating dry dock along the Repair Quay and to provide the required bulk infrastructure for such a facility. The site development plan are attached in the figure below.

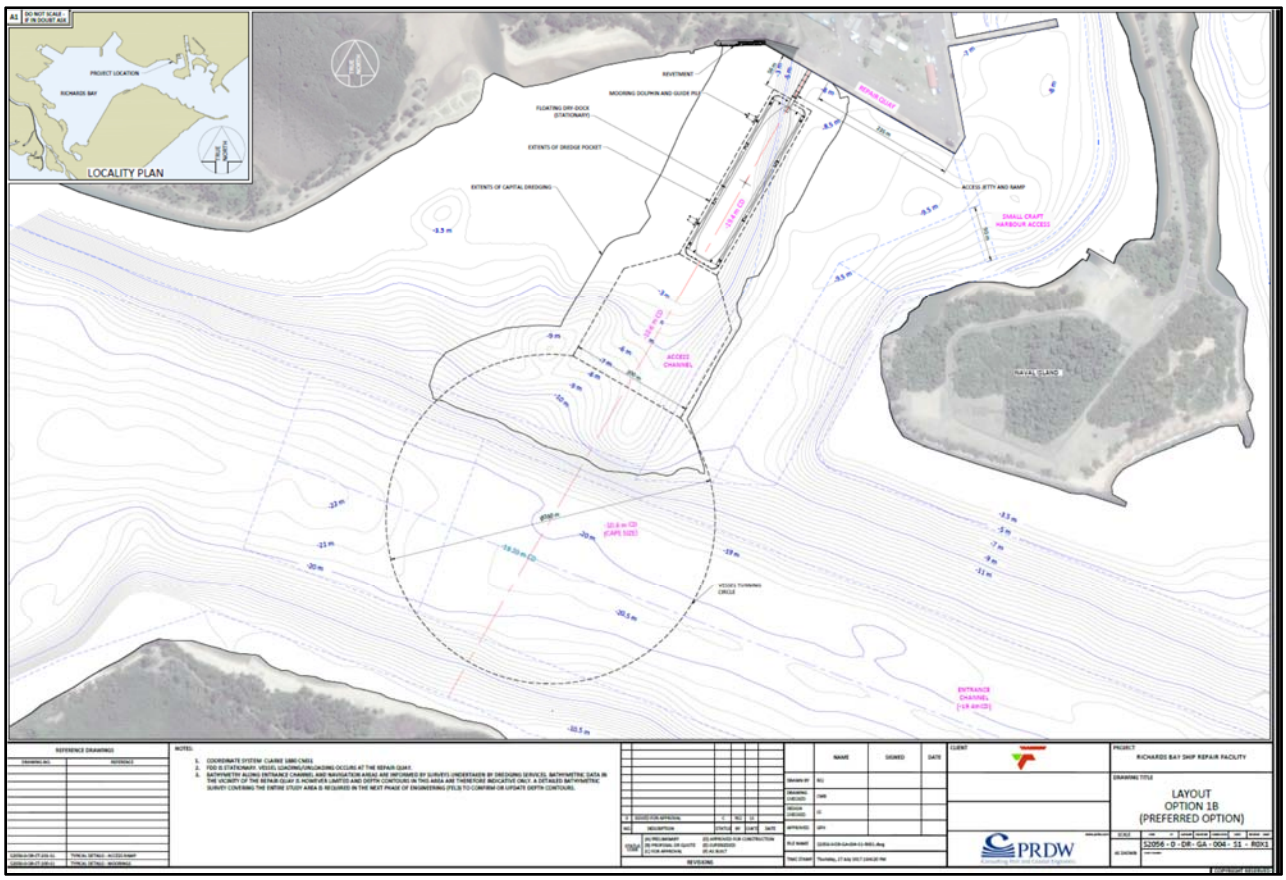

Figure 4: Site development plan

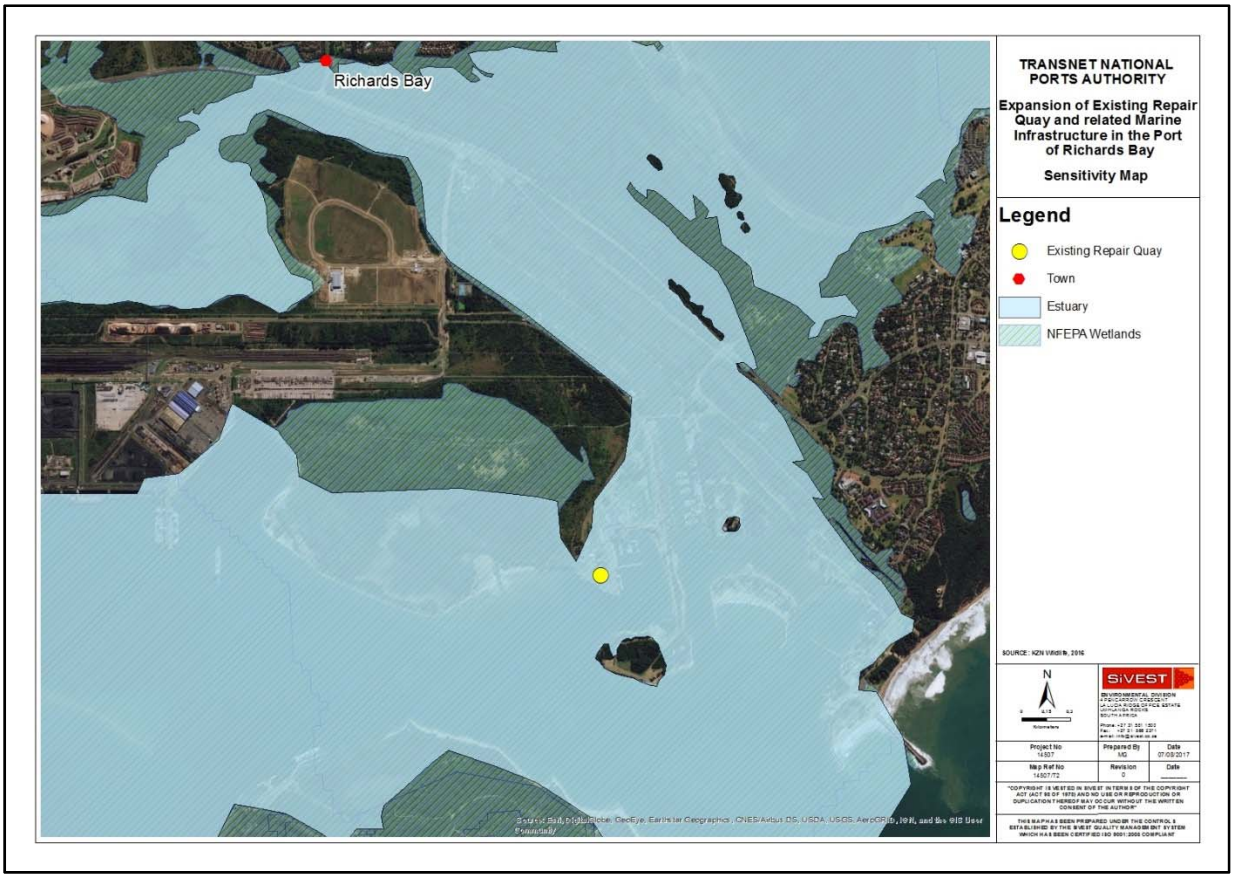

Figure 5: Sensitivity map

This project is based on a concession being given to a private Terminal Operator (TO) who will mobilise a floating dry dock, establish the required ship repair facility and operate the terminal. Authorisation for the Floating Dry Dock Facility will be applied for separately.

The following specialist studies were undertaken to determine the potential impact of the proposed project on the environment:

- Estuarine Impact Assessment,
- Noise and Air Quality Impact Assessments,
- Traffic Impact assessment and
- Underwater Heritage Impact Assessment.

The main findings of the specialist studies are included in Section 17 above.

As the Port of Richards Bay is located in an estuarine bay, an estuarine impact assessment was undertaken by MER (refer Appendix F). The study indicated that the development would have direct and indirect impacts on habitat, benthic macroinvertebrate fauna, ichthyofauna and avifauna in Richards Bay. A number of potential impacts cannot be effectively or fully mitigated given the nature of the project. However, the proposed site was not found to support any rare or particularly productive estuarine habitats or faunal communities. Overall there may be localised residual impacts of medium significance but this would not be anticipated to substantially impact on the health of the system.

The Air Quality Impact Assessment considered the impacts associated with the extension of the existing repair quay and associated infrastructure. The worst-case potential air impacts are considered to be of Negative Medium Impact. Mitigation measures provided are considered adequate to reduce impacts at sensitive receptors to insignificant. It is also important to note that the construction period is approximately 200 days (approximately 7 months) and therefore the impacts experienced at sensitive receptors will be short-lived.

The noise impact assessment findings were that Phase 1 construction noise activities would result in an exceedance of the construction noise threshold at SR1. Night time dredging might be undertaken. The restaurants located at this location all face north east and are likely to screen the noise from patrons, this result reflects the worst-case scenario where construction activities take place at the boundary of the project site, adjacent to SR1. Phase 2, Phase 3 and Phase 4 construction activities were all found to be compliant with the construction the noise threshold.

WSP Environmental (Pty) Ltd considered two potential alternatives associated with the dredged material. The dredging spoil is classified as non-hazardous in accordance with the National Environmental Management: Waste Act and if disposed of terrestrially can be undertaken at an appropriately licenced Class C (GLB+) landfill facility. Given the non-hazardous classification, the preparation of a Safety Data Sheet is not necessary. No major contaminants were recorded and it is therefore highly likely that the spoils are suitable for marine disposal subsequent to dredging. Approximately 1.4 million m^3 of dredged material will need to be disposed of and as a result of this volume the preferred alternative is to dispose of it offshore. TNPA has an existing disposal site that covers an area of approximately 1.7 million m^2. Currently TNPA has a maintenance dredging permit (Permit no 06/2017) in place to dredge a volume of 1.2 million m^3 that expiries in March 2018. An application for a new dredging permit will therefore be required. The Oceans and Coastal Branch of Department of Environmental Affairs is being consulted with in this regard.

The Traffic Impact Assessment conducted determined that the proposed development is not expected to have an adverse impact on the road network within the study area from a traffic perspective, due to the development traffic having minimal impact to the road network.

No sites of significance were recorded during the Underwater Heritage Impact Assessment. Should any heritage objects be unearthed during the dredging process, mitigation measures have been provided in this regard.

In terms of the No-Go Alternative, the existing repair quay would not be expanded in support of the proposed Ship Repair facilities (Floating Dry Dock) at the Port. TNPA's tug boats would continue to sail to Durban for annual maintenance. The Port of Richards Bay would therefore not save costs on fuel, labour and transportation as the tug boats will continue to be serviced in Durban as there will not be a facility available for a Floating Dry Dock. Larger ships would continue to be turned away as the facilities will not be available/adequate for repairs. Furthermore the existing Dormac Floating Dry Dock in Durban would continue to be under pressure to service larger vessels. Additionally Cape size vessels will also not be able to be serviced as there will be no facilities for a Floating Dry Dock able to provide this service to vessels of such a size in South Africa. This will result in lost opportunity to the South African Ports as there would be no facility available to service ships of this size. The Applicant will furthermore fail in terms of the initiative that has been identified as part of Operation Phakisa. No significant benefits associated with the No-Go Alternative have been identified. No environmental risk factors were determined which should prevent the proposed expansion of the repair quay and associated infrastructure at the Port of Richards Bay.

The following provides a summary of the positive and negative impacts associated with the proposed project:

Impact	Pre-mitigation	Post-mitigation
Expansion of Existing Repair Quay & Related Marine Infrastructure		
Habitat loss as a result of capital dredging	Medium negative	No mitigation possible
Increased turbidity as a result of capital dredging	High negative	Low negative
Resuspension of contaminated sediments during capital dredging	Low negative	Very low negative
Habitat loss as a result of supporting infrastructure	Low negative	No mitigation possible
Potential impacts on water and sediment quality	Low negative	Very low negative
Construction noise and vibration	Low negative	No mitigation possible
Maintenance dredging impacts on benthic invertebrate communities	Medium negative	No mitigation possible
Maintenance dredging impacts on water quality	Medium negative	Low negative
Dust soiling	Medium negative	Low negative
Dust impacts on human health	High negative	Low negative
Dust impacts on ecological environment	High negative	Low negative
Impacts on noise sensitive receptors	Medium negative	Low negative
Job creation during construction period	Medium positive	No mitigation required
Provision of infrastructure for a ship repair facility	Very high positive	No mitigation required
No-go Alternative		
Loss of employment opportunities	Medium negative	No mitigation possible
No provision of infrastructure for a ship repair facility	Very high negative	No mitigation

19. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) AND CONDITIONS TO BE INCLUDED IN ENVIRONMENTAL AUTHORISATION (EA)

Mitigation measures from the specialist studies have been included in the EMPr that is attached in **Appendix H.**

Taking into account the potential negative and significant positive impacts that the proposed development could have on the social and biophysical environment, it is the opinion of the EAP that the proposed development should be authorised subject to the following conditions of authorisation:

- All of the mitigation measures identified in this BA Report must be made conditions of the authorisation.
- It is important that all of the listed mitigation measures are costed for in the construction phase financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.
- The construction EMP must be approved by the DEA prior to construction commencing.
- An independent Environmental Control Officer (ECO) must be appointed by the applicant to monitor the implementation of the construction EMP. The ECO should undertake monthly site inspections and compile a monthly environmental audit report.

The following recommendations of the specialist studies should be included in the EA:

Estuarine

- Dredging must only be undertaken using least-impact techniques such as the clamshell dredger:
  - During slack tide and low tide periods;
  - At low to moderate excavations rates;
  - Using bubble net technology to prevent the transport of sediment to other part of the Bay and
  - Strict hopper loading management to avoid the loss of dredge spoil into the bay during transport.
- Sediments at the proposed site must be tested for contamination by heavy metals, ammonia, cyanide, fluoride, hydrogen sulphide, organotin (tributylin) and total petroleum hydrocarbons (parameters with TWQRs for the natural marine environment). Should contamination be detected the best practice mitigation for turbidity management should be applied.
- As far as possible, components of the mooring dolphins should be pre-cast and floated to the proposed site for positioning. This would avoid unnecessary risks associated with handling hazardous substances at the proposed site.
- A spill contingency plan must be developed to ensure that best practice remediation is immediately effected in the event of an incident.

Air Quality

- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.

Noise

- As far as possible, the noisiest construction activities should be undertaken away from SR1 (i.e. the western areas of the project site). The construction laydown areas should be located based on the same principle.
- Site Hoarding should be erected along the project site boundary between SR1 and the construction activities especially where there is no direct noise screening afforded by existing infrastructure).

Underwater Heritage

- The Environmental Control Officer should be given a short induction, by the heritage practitioners, on archaeological site and artefact recognition.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

20. UNCERTAINTIES, ASSUMPTIONS AND GAPS IN KNOWLEDGE

The assessment has been based by SiVEST on information sourced and provided by the Applicant, site visits conducted and the application of the SiVEST assessment criteria. The EAP is of the opinion that the assessment method applied is acceptable. SiVEST assumes that:

- All the information provided by the Applicant is accurate and unbiased.
- The available data, including Topocadastral maps, Orthophotographs, geological maps and Google Earth images, are reasonably accurate.
- All information contained in the specialist studies provided is accurate and unbiased.

- It is not always possible to involve all Interested and/or Affected Parties (I&APs) individually, however, every effort has/is been made to involve as many interested parties as possible. It is also assumed that individuals representing various associations or parties convey the necessary information to these associations / parties.
- It is not possible to determine the actual degree of the impact that the development will have on the immediate environment without some level of uncertainties. Actual impacts can only be determined following construction and/or operation commences, actual impacts will only be determined.

In addition, the following specialist uncertainties, assumptions and gaps are noted:

20.1 Estuarine Impact Assessment

- The assessment was based on existing published data and a single sampling event that provided a snapshot of abiotic and biotic conditions at the proposed site on 18th July 2017. It has been assumed that available historical information remains relevant to the assessment.
- Given the lack of data on biota at the proposed site comparisons have been made with published academic and grey literature on similar habitat types in the bay, such as the Kabeljou Flats. Such comparison has been undertaken with caution given the dominance of intertidal areas on the Kabeljou flats, while the proposed site is predominantly subtidal.
- While the Estuarine Health Index (Turpie, Taljaard, van Niekerk, Adams, Wooldridge, Cyrus, Clark & Forbes 2012) provides a standardised approach to the comprehensive determination of estuary health and function, the stipulated timeframes for the project necessitated a rapid assessment. Therefore, two biotic indicators were selected to assess estuary health – benthic macroinvertebrates and waterbirds. Benthic macroinvertebrates were selected as a reliable indicator and integrator of estuary health and waterbirds provide significant insight into the availability and temporal variation of habitat and food resources of a system at various trophic levels. These results were considered sufficient to provide an overview of estuary health as well as site specific conditions.
- Many aquatic and estuarine studies have been conducted over the past sixty years that provide information on the resources and state of the Richards Bay and Mhlathuze estuaries. However, while this list may be extensive a literature review on the system may not be complete as some reports remain either inaccessible or unknown. However, sufficient information is available to identify key features and important foci.

20.2 Noise Impact Assessment

- The ambient noise monitoring survey measurement were undertaken over 10-minute measurement periods. It must be noted, although diligent effort was made to ensure that each measurement was representative of continuous and long-term characteristic for each measurement location respectively, noise levels at each monitoring location may vary over a longer averaging time period.
- The equipment was manned during the measurement periods and therefore any additional anthropogenic influence that impacted on the noise survey are listed and evaluated in the discussion of results in section 3.7 of the report.
- Field calibration of noise meters were carried out before and after each measurement.

20.3 Underwater Heritage Impact Assessment

- The database is a research tool that is constantly evolving as information is uncovered and added. In addition, the solitary nature of many wrecks means that information may be scarce and/or inaccurate. Therefore, without definitive information, shipwrecks are allocated to an area, based on limited information and certain assumptions regarding the dynamic nature of the environment.

21. AUTHORISATION OF EXPANSION OF EXISTING REPAIR QUAY AND RELATED MARINE INFRASTRUCTURE IN THE PORT OF RICHARDS BAY

We request that the Department authorizes the development as no fatal flaws have been identified. Furthermore the infrastructure is required for the operation of a Floating Dry Dock, the need for which has been clearly identified. The development furthermore forms part of Operation Phakisa. Over the last 12 months 200 jobs have already been created through this initiative and R7 billion created in building new port facilities, as well as the refurbishment and maintenance of existing ports.

Conditions to be included in the Environmental Authorisation are listed in Section 19 above.

The environmental authorization should be valid for a period of 5 years. Since there will be no operational aspects of the marine infrastructure, it is anticipated that the construction period will commence during January 2019.

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