PROPOSED OFFSHORE SANDWINNING FOR DEVELOPMENTS WITHIN THE PORT OF DURBAN, KWAZULU NATAL

Scoping Report

DMR Reference No.: KZN30/5/1/1/2/00070BP

September 2016

Draft

Prepared for: Transnet National Port Authority

NEMAI CONSULTING

Environmental, Social and OHS Consultants

P.O. Box 1673
Sunninghill
2157

147 Bram Fisher Drive
Ferndale
2194

Tel: 011 781 1730
Fax: 011 781 1731
Email: info@nemai.co.za

Title and Approval Page

Project Name:	Proposed Offshore Sandwinning For Developments Within The Port Of Durban, Kwazulu Natal
Report Title:	Scoping Report
Authority Reference:	KZN30/5/1/1/2/00070BP
Report Status	Draft

Applicant	Transnet National Port Authority

Prepared By:	Nemai Consulting			
NEMAI CONSULTING	☎	+27 11 781 1730		147 Bram Fischer Drive, FERNDALE, 2194
	🖷	+27 11 781 1730		
	✉	donavanh@nemai.co.za		PO Box 1673, SUNNINGHILL, 2157
		www.nemai.co.za		
Report Reference:	10451			R-PRO-REP|20150514

Authorisation	Name	Signature	Date
Author:	V Stippel and D Henning		20 September 2016
Reviewed By:	N Naidoo		20 September 2016

Amendments Page

Date:	Nature of Amendment	Amendment Number:
20/09/2016	Draft for Authorities and Public Review	0

Executive Summary

This document serves as the Draft Scoping Report for the proposed offshore sandwinning for developments within the Port of Durban.

The Port of Durban is South Africa's premier container port (handling 65% of South Africa's container traffic) and the principal port serving KwaZulu-Natal and the Gauteng region as well as the South African hinterland. The port handles over 4 700 commercial vessels annually, the highest number in South Africa.

Major growth areas for the port are seen to be in containers. Container size is often described as Twenty foot Equivalent Unit and between 2003 and 2011, there has been a 7.2% increase in the number of containers landed in the Port of Durban (Urban-Econ, 2012). This trend of increased containers has continued into 2012 which suggests that container traffic will continue to increase. Over the next ten years, demand along the Durban–Gauteng corridor is expected to grow from 2.6 million Twenty foot Equivalent to 4.2 million Twenty foot Equivalent.

The Port of Durban currently has a capacity of 3.4 million Twenty foot Equivalent, but infrastructure, land and logistics constraints hinder the alignment with the design capacity. Optimisation of the existing facilities is vital to the provision of short term capacity.

In light of the economic importance of the Port of Durban and containerized cargo as well as the current global trends which show increasing vessel sizes, Transnet National Port Authority has recognized the need to prepare for future container growth. As part of this, the Port of Durban has started a process for a phased container capacity expansion programme in order to improve throughput capacity by reconfiguring and rationalising the existing Durban container terminal.

Pier 1 Phase 2 Project is part of the expansion programme and is seen as the key to the provision of medium and long term capacity. Other major expansion projects in the short term include deepening and lengthening of the North Quay, berth reconstruction and deepening at Island View and Maydon Wharf.

As part of these expansions, Transnet National Port Authority has recognized the need for sandwinning of approximately 4.5 million m^3 of offshore material. However, it should be noted that this Scoping and Environmental Impact Assessment process will concentrate only on the offshore sandwinning activity. The use of the material within the Port will require separate authorization in terms of NEMA (Act No. 107 of 1998).

Furthemore, it should be noted that a separate authorisation process has already been undertaken for the Deepening, Lengthening and Widening of Berths 203 to 205 (NEAS REF NO: DEA/EIA/0000988/2012; DEA REF NO: 14/12/16/3/3/2/275). Whilst this process did assess the impact of offshore sandwinning (including undertaking of specialist studies and recommending a preferred sandwinning alternative), the Department of Environmental Affairs was not able to authorize the activity as it related to Mining. Subsequent to this, the 2014 Environmental Impact Asssessment Regulations have been promulgated and thus the Department of Mineral Resources is the competent authority in respect to Mining Activities and a separate authorisation process is required.

Two potential offshore sandwinning sites have been identified. Alternative Site 1 occurs approximately 1,2 km east of the Port of Durban harbour mouth and is approximately 110 hectares in size. Alternative Site 2 occurs slightly south of Alternative Site 1 and is approximately 250 hectares in size. The proposed offshore sandwinninng will be undertaken using a Trailing Suction Dredger (either Trailing Suction Dredger or Trailing Suction Hopper Dredger. The volume of material to be mined is approximately 4.5 million cubic metres over a 30 year period.

The process for seeking authorisation is undertaken in accordance with the EIA Regulations (Government Notice No. R. 982, R. 983, R. 984 and R. 985 of 04 December 2014), promulgated in terms of Chapter 5 of the National Environmental Management Act, which therefore requires an environmental assessment through a Scoping and EIA process.

In terms of the Regulations, the lead decision-making authority for the Scoping and EIA is the Department of Mineral Resources.

In addition, due to the size of proposed sand winning area (between 110 hectares and 250 hectares), a Mining Right in terms of the Section 22 of the Mineral and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002) is also required.

The Scoping Report for the proposed offshore sandwinning provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed sandwinning. The following environmental features have been considered:

1. Climate;
2. Maritime Archaeoloy;
3. Tourism;
4. Geology;
5. Bathymetry;
6. Ocean Currents;

7. Marine Sensitivity;
8. Avifauna;
9. Turbidity;
10. Marine Biota; and
11. Socio-Economic Environment.

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, the Scoping report identified potential significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA Phase, where the analysis is largely limited to significant issues and reasonable alternatives.

The Scoping Report then provided a Plan of Study for the Environmental Impact Assessment which explains the approach to be adopted to conduct the EIA for the proposed offshore sandwinning. This includes a summary of the key environmental issues, specialist studies, public participation and proposed timeframes. The specialist studies recommended for the Environmental Impact Assessment Process are as follows:

1. Marine Impact Assessment;
2. Underwater Heritage Assessment; and
3. Wave Modelling Study.

As part of the Scoping and Environmental Impact Assessment, public participation is required. The public participation process that was followed for the proposed project is governed by the National Environmental Management Act and Government Notice No. R. 982. Details of the public participation process followed are provided in the report however in summary, a general Interested and Affected Party database was compiled and included Interested and Affected Parties from the Berth 203 to 205 Expansion project as well as the Durban Bay Estuary Management Plan Database. These stakeholders were notified of the initial registration period by email and SMS. In addition, an advert was placed in the Isolezwe Newspaper and site notices were placed around the Port of Durban. Registered Interested and Affected Parties were notified of the review of the Draft Scoping Report via newspaper notices, onsite notices and emails.

It is the opinion of the Environmental Impact Assessment team that Scoping was executed in an objective manner and that the process and report conform to the requirements of regulations of GN. No. R. 982 (04 December 2014).

It is also believed that the Plan of Study for the Environmental Impact Assessment is comprehensive and will be adequate to address the significant issues identified during Scoping, to select the Best Practcable Environmental Option and to ultimately allow for informed decision-making.

Table of Contents

List of Tables

List of Figures

List of Annexes

List of Abbreviations

EIA	Environmental Impact Assessment
BID	Background Information Document
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Area
COP	Conference of the Parties
C-Plan	Conservation Plan
DAC	Durban Adaptation Charter
DAFF	Department of Agriculture, Forestry and Fisheries
DCT	Durban Container Terminal
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Mineral Resources
DPE	Department of Public Enterprised
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EEZ	Economic Exclusion Zone
EKZNW	Ezemvelo KZN Wildlife
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
GHG	Greenhouse Gaes
GN	Government Notice
GPS	Global Positioning System
IAPs	Interested and Affected Parties
ICAO	International Civil Aviation Organization
IDP	Integrated Development Plan
IMO	International Maritime Organization
ITTCC	Industry Task Team on Climate Change
KZN	KwaZulu-Natal
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973/1978
MDG	Millenium Development Goals
MPA	Marine Protected Area
MRPDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)

NEMA	The National Environmental Management Act (Act No. 107 of 1998)
NHRA	The National Heritage Resources Act (Act No. 25 of 1999)
NPA	The National Ports Act (NPA), 2005 (Act No. 12 of 2005)
NSBA	National Spatial Biodiversity Assessment
OHS	Occupational Health and Safety
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SOC	State Owned Company
TEMPI	Transnet eThekwini Municipality Planning Initiative
TEU	Twenty Foot Equivalent
TNPA	Transnet National Port Authority
TSD	Trailing Suction Dredger
TSHD	Trailing Suction Hopper Dredger
UNDP	United Nations Development Programme
UNFCCC	The United Nations Framework Convention on Climate Convention

Definitions of Key Terms

Alternatives	In relation to a proposed activity, alternatives refer to the different means of meeting the general purpose and requirements of the activity, which may include alternatives to: • The property or location where it is proposed to undertake the activity; • The type of activity to be undertaken; • The design or layout of the activity; • The technology to be used in the activity; • The operational aspects of the activity; and • The option of not implementing the activity.
Anthropogenic	Produced or caused by humans.
Bathymetry	The sea bed "topography" derived from measurements of depths of water.
Benthic	Referring to organisms living in or on the sediments of aquatic, estuarine and marine habitats.
Benthos	The sum total of organisms living in, or on, the sediments of aquatic habitats.
Biodiversity	The variety of life forms, including the plants, animals and micro-organisms, the genes they contain and the ecosystems and ecological processes of which they are a part.
Biota	The sum total of the living organisms of any designated area.
Environment	The biophysical, social, economic, cultural, political and historical context within which people live and within which development takes place.
Environmental impact	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
Environmental impact assessment	Environmental Impact Assessment means a systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Environmental issue	A concern felt by one or more parties about some existing, potential or perceived environmental impact.
Interested and affected party	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
Macrofauna	Animals which are greater than 1 mm.
Macrophyte	A member of the macroscopic plant life of an area, especially of a body of water; large aquatic plant.
Molluscs	A phylum of organisms containing snails, mussels, oysters.
Pollution	The introduction of unwanted components into waters, air or soil, usually as result of human activity; e.g. hot water in rivers, sewage in the sea, oil on land.
Sandwinning	Sandwinning is a form of sand mining usually associated with the dredging of offshore infill material.
Scoping	This refers to the process of determining the spatial and temporal boundaries (the extent) for the EIA and key issues to be addressed in an environmental assessment.
Sediment	Unconsolidated mineral and/or organic particulate material.
Significant impact	An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Suspended material	Total mass of material suspended in a given volume of water, measured in mg/l.
Turbidity	Turbidity is the attenuation of light in water caused by the sum of suspended particles and any dissolved chemicals in the water which may alter the passage of light through scattering (generally inorganic and organic particles) and/or absorption (generally particulate or dissolved biological material).

Vulnerable	A taxon is vulnerable when it is facing a medium risk of extinction in the wild in the medium-term future, defined as a 10% probability of extinction within 100 years.

1 DOCUMENT ROADMAP

This document serves as the Draft Scoping Report (DSR) for the proposed offshore sandwinning for developments within the Port of Durban, KwaZulu-Natal (KZN). In order to provide clarity to the reader, a document roadmap is provided below. The document roadmap provides information on the requirements of the 2014 Environmental Impact Assessment (EIA) Regulations as stipulated in Appendix 2 of Government Notice (GN) No. R. 982 (04 December 2014) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) as well as a guide on the content of each chapter. Please note that in some cases more information is provided than required in the EIA regulations in which case there will be no correlating section to the 2014 EIA Regulations.

Table 1: Document Roadmap

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
1.	Document Roadmap	-	-
2.	Purpose of this Document	-	-
3.	Environmental Assessment Practitioner	2 (a)	Details of – i) the EAP who prepared the report; and ii) the expertise of the EAP, including a curriculum vitae.
4.	Project Background and Motivation	2 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity within the context of the preferred location.
5.	Project Location	2 (b)	The location of the activity including – i) The 21 digit Surveyor General code of each Cadastral land parcel; ii) Where available, the physical address and farm name; and iii) Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties.
		2 (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or if it is – i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is undertaken; and

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			ii) On land where the property has not yet been defined, the coordinates within which the activity is to be undertaken.
6.	Project Alternatives	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: i) Details of all alternatives considered; ix) The outcome of the site selection matrix; x) If no alternatives including alternative locations for the activity were investigated, the motivation for not considering such.
7.	Project Description	2 (d)	A description of the scope of the proposed activity, including – i) All listed and specified activities triggered; and ii) A description of the activities to be undertaken, including associated structures and infrastructure.
8.	Legislation and Guidelines Considered	2 (e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.
9.	Scoping and EIA Process	-	-
10.	Assumptions and Limitations	-	-
11.	Need and Desirability	2 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity within the context of the preferred location.
12.	Profile of the Receiving Environment	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: iv) The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
13.	Public Participation	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations including copies of supporting documents and inputs; and iii) A summary of the issues raised by IAPS and an indication of the manner in which the issues were incorporated or the reasons for not including them.
14.	Environmental Issues	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: v) The impacts and risks identified for each alternative including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources; and can be avoided, managed or mitigated; vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. viii) The possible mitigation measures that could be applied and level of residual risk.
15.	Methodology to Assess the Identified Impacts	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.
16.	Plan of Study for EIA	2 (i)	A plan of study for undertaking the environmental impact assessment process to be undertaken including – i) A description of the alternatives to be considered and assessed within the preferred site including the option of not proceeding with the activity; ii) A description of the aspects to be assessed as part of the EIA process; iii) Aspects to be assessed by specialists;

Chapter	Title	Correlation with Appendix 2 of GN No. R. 982	
			iv) A description of the proposed method of assessing the environmental aspects including the proposed method for assessing the environmental aspects including aspects to be assessed by specialists; v) A description of the proposed method of assessing duration and significance; vi) An indication of the stages at which the competent authority will be consulted; vii) Particulars of the public participation process that will be conducted during the EIA Phase; viii) A description of the tasks that will be undertaken as part of the EIA Phase; and ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.
17.	EAP Declaration and Conclusion	2 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: xi) A concluding statement indicating the preferred alternative, including preferred location of the activity.
		2 (j)	An undertaking under oath or affirmation by the EAP in relation to: i) The correctness of the information provided in the report; ii) The inclusion of comments and inputs from stakeholders and IAPS; and iii) Any information provided by the EAP to IAPS and any responses by the EAP to comments or inputs made by IAPS.
		2 (k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and IAPs on the Plan of Study for undertaking the EIA.
18.	References	-	-
-		2 (l)	Where applicable, any specific information required by the Competent Authority.
-		2 (m)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act.

2 PURPOSE OF THIS DOCUMENT

The DSR is an important document as it precedes the first phase of the EIA process and thus outlines the Scoping process to be followed for the proposed offshore sandwinning which aims to:

- Introduce the proposed project to all Interested and Affected Parties (IAPs);
- Engage with IAPs to allow for participation in the process that is transparent, cooperative, informative and robust. Allow for informed decision-making with regard to the EIA process;
- Identify the significant issues and impacts to be investigated further during the execution of the EIA phase;
- Consider suitable and feasible alternatives for achieving the project's objectives; and
- Determine the scope of the ensuing EIA phase in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives.

Further, according to Appendix 2 of the 2014 EIA Regulations (GN No. R 982), the objectives of the Scoping process are, through consultation, to:

- Motivate the need and desirability of the proposed development, including the need and desirability of the proposed offshore sandwinning in the context of the proposed location.
- Clarify the roles and responsibilities of the various stakeholders in the project;
- Identify all potential IAPs by following the public participation approach adopted for this project. Engage with IAPs through communication of all correspondence on the project and by consideration of IAP comments through responses;
- Identify the relevant policies and legislation applicable to the proposed offshore sandwinning.
- Undertake a desktop research on the receiving environment of the proposed site;
- Identify and confirm the selected site, through a detailed site selection process which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on geographical, physical, biological, social, economic and cultural aspects of the environment;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required, as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the proposed site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the proposed site. Identify suitable measures to

avoid, manage or mitigate identified impacts and to determine the extent of residual risks that need to be managed or monitored; and
- Present the plan of study for the EIA to IAPs.

The DSR will be made available to IAPs for a 30-Day review period. All comments received will be assessed in the Final Scoping Report and will also be noted in the Comments and Responses Report. The Final Scoping Report will then be made available for further public review at the same time as being submitted to Department of Mineral Resources (DMR), who is the Competent Authority in respect to this proposed development. All further comments submitted by registered IAPs on the Final Scoping Report will be forwarded to the relevant DMR Official to take into consideration when making the decision to approve or reject the Final Scoping Report. Comments received by IAPs will therefore help shape the subsequent EIA Phase.

It should be noted that the proposed activity requires a Mining Right in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA- Act No. 22 of 2002). As such, this document and the subsequent EIA Phase aims to fufill the requirements in terms of the both the NEMA (Act No 107 of 1998) and MPRDA (Act No 22 of 2002).

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nemai Consulting was appointed by Transnet National Port Authority (TNPA) as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental assessment and Mining Right process for the proposed offshore sandwinning process for developments within the Port of Durban. In accordance with Section 2 (a) of Appendix 2 of GN No. R. 982 of 04 December 2014, this section provides an overview of Nemai Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the Scoping and EIA team.

Nemai Consulting is an independent, specialist environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999. The company is directed by a team of experienced and capable environmental engineers, scientists, ecologists, sociologists, economists and analysts.

The core members of Nemai Consulting that are involved with the Scoping and EIA process for the proposed offshore sandwinning are captured in the table below, and their respective Curricula Vitae are contained in to **Appendix 1**.

Table 2: *Scoping and EIA Core Team Members*

Name	Qualifications	Duties
Ms D. Naidoo	BSc Eng (Chem)	Project Manager Environmental Engineering
Ms V. Stippel	BSc. (Hons) – Ecology, Environment and Conservation MSc. – Ecology, Environment and Conservation Professional Member of the South African Institute of Ecologists and Environmental Scientists	EIA Process Scoping & EIA Reports
Mr D. Henning	BSc (Hons) Aquatic Health M.Sc River Ecology	EIA Process Scoping & EIA Reports
Mr C. Chidley	BSc Eng (Civil); BA (Economics, Philosophy) MBA	Environmental Engineering EMPr
Ms K. Robertson	MSc (Env Management)	EIA process

4 PROJECT BACKGROUND AND MOTIVATION

4.1 Overview of the Port of Durban

The Port of Durban is South Africa's premier container port (handling 65% of South Africa's container traffic) and the principal port serving KwaZulu-Natal and the Gauteng region as well as the South African hinterland. The port handles over 4 700 commercial vessels annually, the highest number in South Africa.

Major growth areas for the port are seen to be in containers. Container size is often described as Twenty foot Equivalent Unit (TEU) and between 2003 and 2011, there has been a 7.2% increase in the number of containers landed in the Port of Durban (Urban-Econ, 2012). This trend of increased containers has continued into 2012 which suggests that container traffic will continue to increase. Over the next ten years, demand along the Durban–Gauteng corridor is expected to grow from 2.6 million TEU to 4.2 million TEU.

The Port of Durban currently has a capacity of 3.4 million TEU, but infrastructure, land and logistics con-straints hinder the alignment with the design capacity. Optimisation of the existing facilities is vital to the provision of short term capacity.

4.1.1 Economic Importance of the Port of Durban

The need for the expansion within the port has been triggered by prolonged congestion arising from a capacity crisis in many aspects of port operations. With steady and accelerating economic growth and the lowering of barriers to international trade, there have

been increased volumes of seaborne traffic and as a major generator of transport activity and economic generation; the port is a strategic focus area in the eThekwini Municipality.

Economic activity related to the Port of Durban involves direct and indirect port-dependent activity and includes numerous activities and services because ship operations require a wide range of support services (Van Coller *et al.,* 2008). The multiplier effect in terms of value added, jobs and local wealth creation from providing a full range of services to over 4500 ship arrivals a year, is large and highlights the economic importance of the Port to Durban, eThekwini and South Africa.

4.1.2 Importance of Containerised Cargo in the Port of Durban

The Port of Durban can be seen as the premier gateway port in South Africa and as the South African economy grows, so does the need for a greater capacity to cater for growing freight volumes at the Port. In the past 10 years, the growth in containerised traffic through the Port of Durban has been three times the national GDP growth rate. It is currently forecast that the existing transportation infrastructure will reach its limit by 2019 and unless significant expansion takes place, South African economic growth will be constrained.

4.1.3 International Shipping Trends

With the global trend of containerisation, there has been a progressive trend of increasing vessel size. In the 1970s, 1000 and 1500 TEU ships were replaced by 2000+ TEU ships and by the early 1990s, most major shipping lines had ordered 4000+ TEU Panamax vessels. The rate of increase in vessel size accelerated in the 1990s, when shipping lines deployed vessels too large to transit the Panama Canal (Post-Panamax vessels). Vessel sizes are still growing and ships up to 16 000 TEU are expected in the future.

4.2 Motivation

In light of the economic importance of the Port of Durban and containerized cargo as well as the current global trends which show increasing vessel sizes, TNPA has recognized the need to prepare for future container growth. As part of this, the Port of Durban has started a process for a phased container capacity expansion programme in order to improve throughput capacity by reconfiguring and rationalising the existing Durban container terminal (DCT).

Pier 1 Phase 2 Project is part of the expansion programme and is seen as the key to the provision of medium and long term capacity. Other major expansion projects in the short term include deepening and lengthening of the North Quay, berth reconstruction and deepening at Island View and Maydon Wharf.

As part of these expansions, TNPA has recognized the need for sandwinning of approximately 4.5 million m^3 of offshore material. However, it should be noted that this

Scoping and EIA process will concentrate only on the offshore sandwinning activity. The use of the material within the Port will require separate authorization in terms of NEMA (Act No. 107 of 1998). For instance, a separate EIA process was undertaken for the Deepening, Lengthening and Widening of Berths 203 to 205 (NEAS REF NO: DEA/EIA/0000988/2012; DEA REF NO: 14/12/16/3/3/2/275) and thus the use of infill material within the Port for this project is already authorized. However other developments requiring infill material which will be obtained by sandwinning may still require authorisation.

Furthermore, it should also be noted that in terms of the proposed Deepening, Lengthening and Widening of Berths 203 to 205, the EIA process did include offshore sandwinning as part of the scope. As such specialist studies were undertaken of the proposed site and a preferred site was identified. However, in terms of the 2010 EIA Regulations, DEA could not authorize activities related to mining and thus the authorisation did not include sandwinning. Further, the 2014 EIA Regulations now require a separate EIA process be undertaken for the sandwinning activities as DMR is now the competent authority in respect to activities related to Mining.

5 PROJECT LOCATION

As per R28 (1) (d) of GN 543 of 18 June 2010 and Section 2 (b) and (c') of Appendix 2 of GN 982 of 4 December 2014 the following information regarding the project location is provided in this section:

- A description of the property on which the activity is to be undertaken and the location of the activity on the property;
- The location of the activity including –

  – The 21 digit Surveyor General code of each Cadastral land parcel;
  – Where available, the physical address and farm name; and
  – Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties

- A plan which locates the proposed activity or activities applied for at an appropriate scale, or if it is-

  – A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is undertaken; and
  – On land where the property has not yet been defined, the coordinates within which the activity is to be undertaken.

It should be noted that as the proposed mining activity takes place off the east coast of South Africa and as such there is no available farm name and 21 digit code.

Please note that A3 copies of all maps contained in this Section are contained in **Appendix 2.**

5.1 Regional and Local Context

Figure 1 to **Figure 2** provide the regional context of the proposed development.

The proposed activity will take place approximately 1-2km east of the Port of Durban. Coordinates of the proposed alternative sites are provided in **Table 3**.

Table 3: Coordinates of Site

Site	Corner Coordinates
Alternative Site 1	29°51'50.636708"S; 31°4'15.965188"E 29°51'14.072976"S; 31°5'32.66397"E 29°51'22.946862"S; 31°5'37.797436"E 29°52'13.029995"S;31°4'16.328564"E
Alternative Site 2	29°52'13.029995"S;31°4'16.328564"E 29°51'23.708114"S; 31°5'38.205261"E 29°51'54.207095"S; 31°5'54.498875"E 29°52'40.037115"S; 31°4'15.988057"E

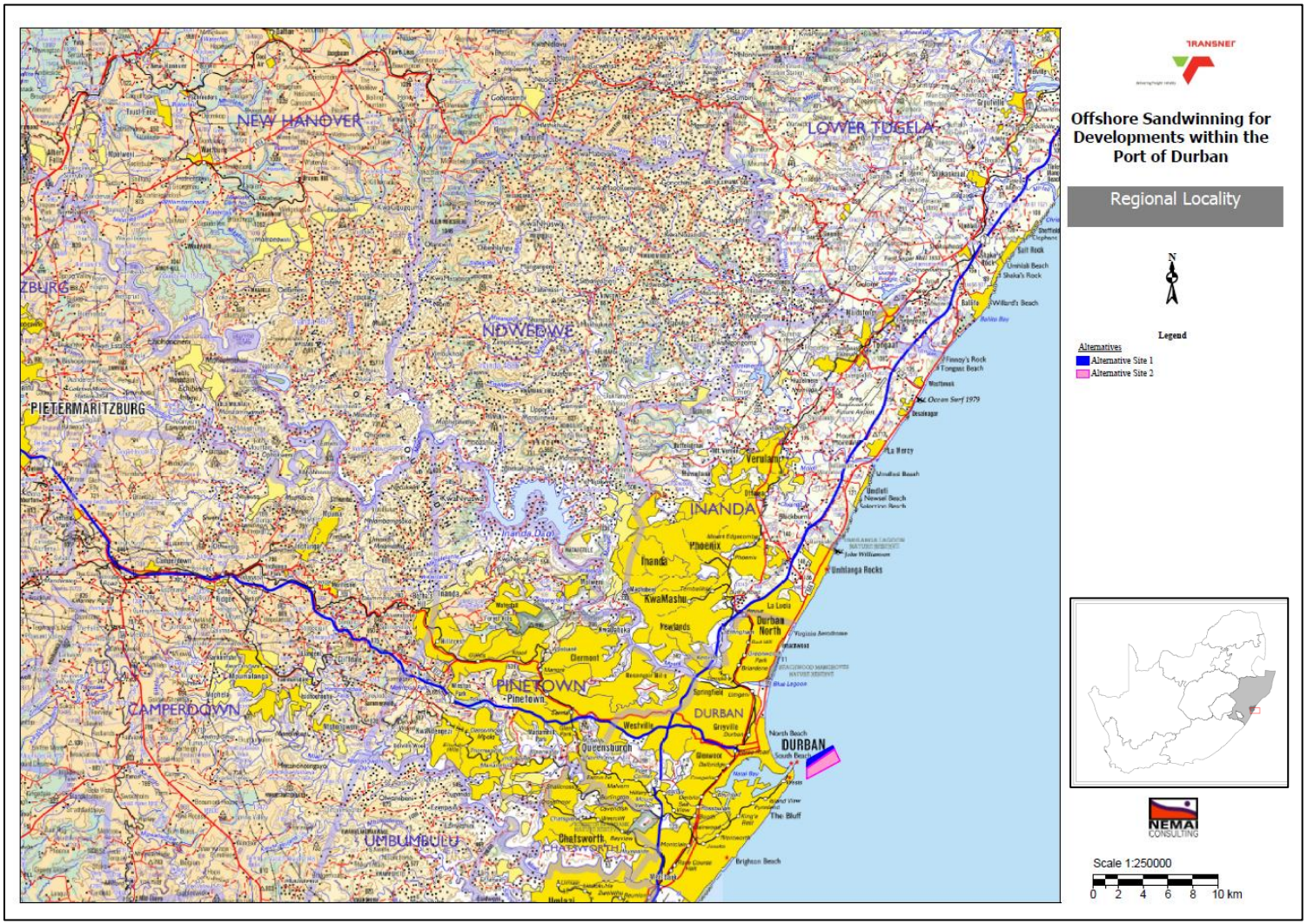


Figure 1: Regional Location

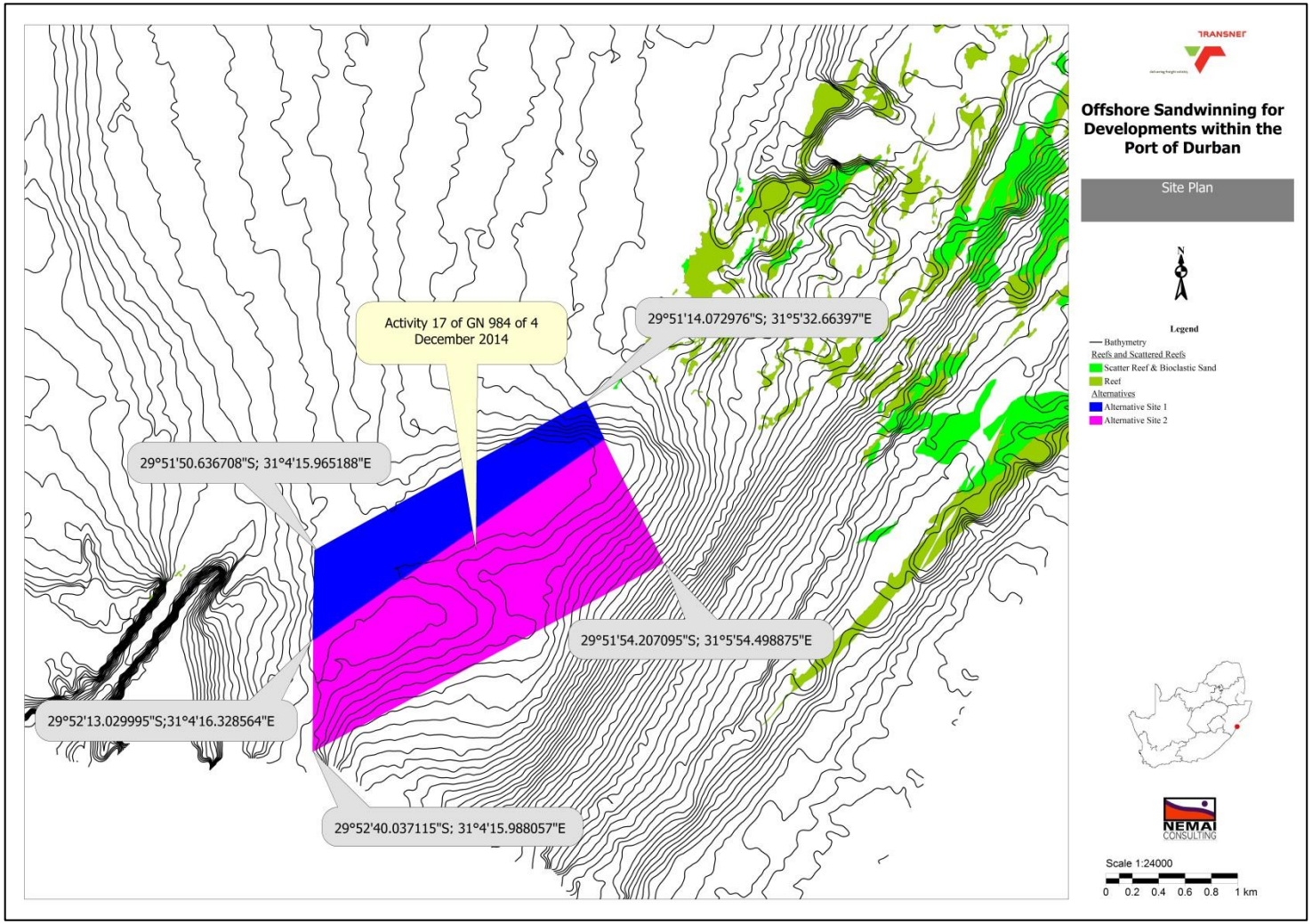


Figure 2: Project Location

6 PROJECT ALTERNATIVES

6.1 Screened Alternatives

A previous study by the Council for Geoscience (2001) previously identified two potential offshore sandwinning sites, namely, Area 1 and and Area 2 **(Figure 3**).

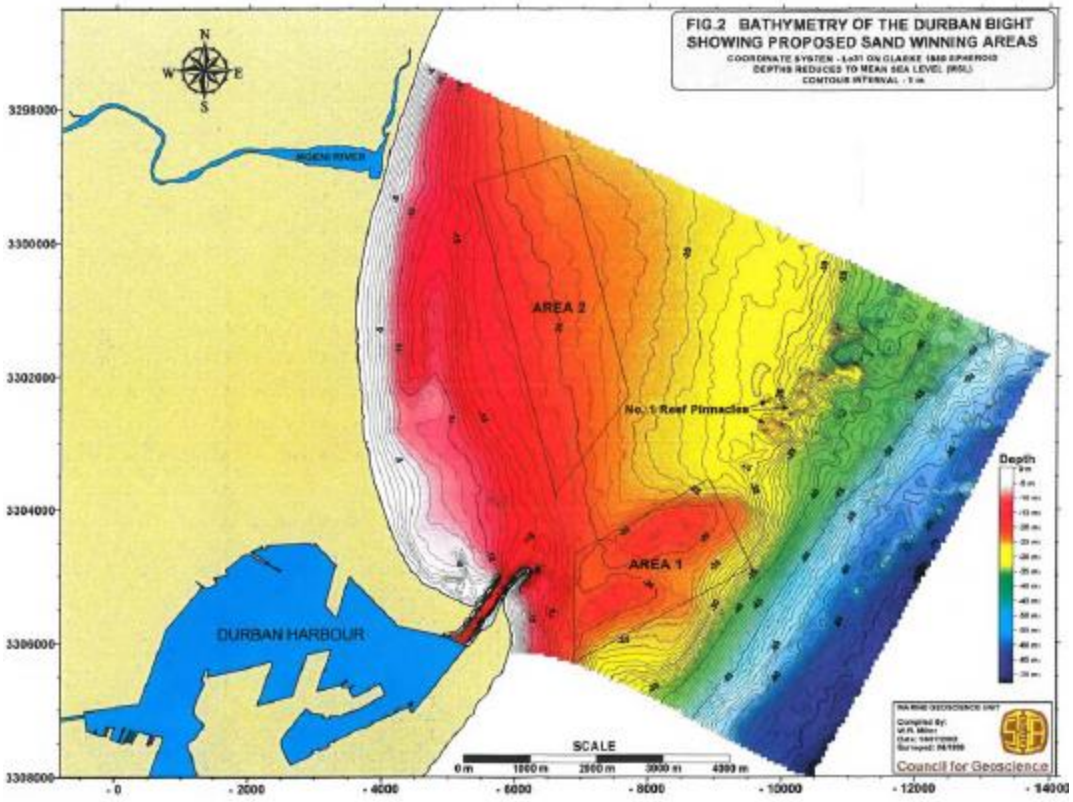


Figure 3: Location of Offshore Sandwinning Sites Previously Investigated (Council of Geosciences, 2001)

Both areas where investigated as part of previous projects and the following was determined:

- The Bathymetry in Area 1 varies from 19 to 32 m depth and from 18 to 23 m in Area 2.
- The seafloor in Area 1 is dominated by two discrete sand mounds which occupy much of the site. The presence of shallow pinnacles immediately to the northeast of the site and the presence of patches of scattered reef in the site indicate that the site is probably underlain by reef and covered with a thin veneer of sand. The average thickness of unconsolidated sediment in Area 1 is estimated at 3.6 m but ranges from 0 m on the reef outcrops to a maximum of 9.5 m. In contrast, Area 2 is characterised

by uniform bathymetry that dips gently towards the northeast. No rocky features are evident in Site 2. Sediment thickness at this site ranges between 2.5 to 11.2 m, averaging 5.2 m.

- Grab and core sampling undertaken by the Council of Geosciences (2001) indicated that sediments in Area 1 are on the whole coarser grained, have a higher gravel content, lower interstitial mud content, significantly lower calcium carbonate content, and significantly higher "compact" densities than those in Area 2. Coarse sediment will decrease the amount of fine suspended sediment and therefore minimise turbidity and deposition of fine sediment on nearby reef habitat.
- Site 2 (the northernmost site) was found to be largely pristine (Council of Geosciences, 2001).
- From an underwater heritage perspective, the coastline section where Area 2 is located witnessed the majority of the region's shipwrecks. A high number of magnmeter hits seen in this area during previous studies may well indicate the spreading, through time, of the remains of these wrecks. In addition, it is a sandy area that experiences large sediment deposits from the Umgeni River (Miller and Leuci: 2001). These sediment deposits assist in covering possible underwater heritage sites.
- A shipwreck known as Stuart's wreck may occur in the southern part of Area 1.

Based on this information, Area 2 was screened out and has not been assessed as a feasible alternative.

6.2 Feasible Alternatives

Based on previous studies, two potential off-shore sandwinning sites have been identified. More information on these alternatives are provided in the subsections to follow. A3 layouts are provided in **Appendix 3.**

6.2.1 Alternative Site 1

Alternative Site 1 occurs approximately 1,2 km east of the Port of Durban harbour mouth and is approximately 110 hectares in size.

The bathymetry of Alternative Site 1 varies from a minimum of -19m to a maximum depth of –20m (Council of Geociences, 2001). The area is dominated by a northern mound which measures 2000m in length, 750m in width and 10m in height. In general, the bathymetry is gently undulating with bathy-metric gradients varying from 0.14° to 0.69° (**Figure 4**).

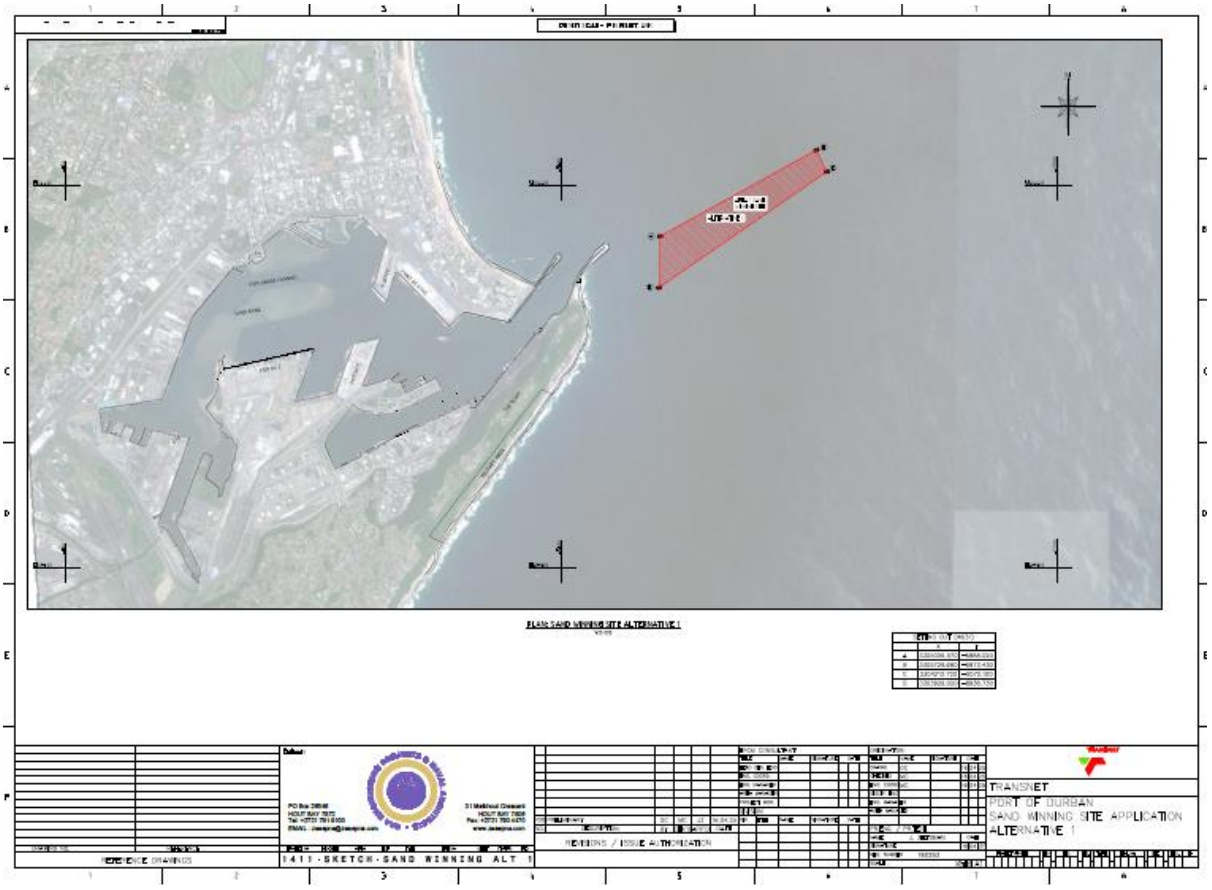


Figure 4: Alternative Site 1

6.2.2 Alternative Site 2

Alternative Site 2 occurs slightly south of Alternative Site 1 and is approximately 250 hectares in size.

In terms of bathymetry, Alternative Site 2 varies from approximately –20m to a maximum of –32m (Council of Geosciences, 2001). The site also has a mound which is approximately 1500m in length, 700m in width and only 2-3m in height (**Figure 5**).

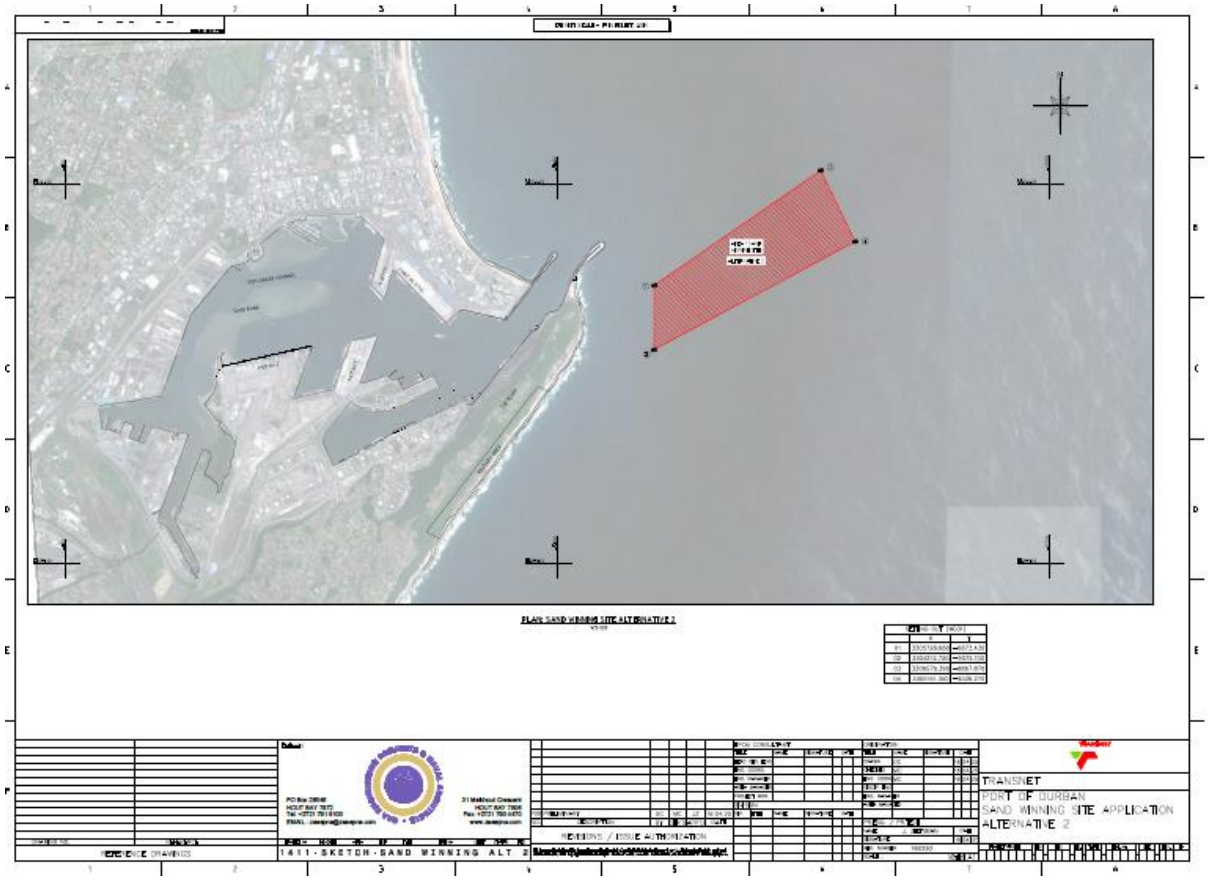


Figure 5: Alternative Site 2

6.3 No-go alternative

The no-go implications for the Port are twofold. Firstly, without offshore infill material, the various Port expansion projects will not be able to proceed. This will have an impact on TNPA's business. Secondly, the Transnet eThekwini Municipality Planning Initiative (TEMPI) undertook an economic assessment of the Port of Durban in 2007. The study found that if infrastructure within the Port was not upgraded to respond to international trends, the Port of Durban will not maintain a competitive level of services, large vessels will make use of competitor Ports, there will be a loss of income in terms of wages and salaries and a negative economic impact on the local and national economy and a negative impact on related industries.

7 PROCESS DESCRIPTION

7.1 Volume of Material

Offshore Sandwinning operations will be limited to a total of approximately 4.5 million m^3 of offshore material which is required for delvelopments within the Port.

As mentioned in **Section 6**, two alternative sites are being assessed, Alternative Site 1 and Alternative Site 2, which are approximately 110 hectares and 250 hectares in extent respectively.

In order to obtain the required volume of material from either alternative, sandwinning will proceed to approximately 4.1m in Alternative Site 1 and approximately 1.8m in Alternative Site 2.

7.2 Equipment to be Used

The proposed offshore sandwinninng will be undertaken using a Trailing Suction Dredger (either Trailing Suction Dredger (TSD) or Trailing Suction Hopper Dredger (TSHD)).

The excavating and pumping mechanism is the same in each case, but the difference lies in whether the dredger is fitted with its own hoppers to store the dredged material and transport it to the disposal site or not.

TSDs and TSHDs are self-propelled ships, equipped with articulated dredging pipes that extend to the sea bottom. They dredge while sailing forward at slow speeds. Dragheads can be active or passive. The active draghead requires additional power in order to drive cutting teeth or high pressure water jets to excavate material and to assist with the formation of the water-solid slurry. Depending on the size of the dredger, dredge depths of up to 100 m have been achieved. They are however unsuitable for dredging close to existing structures or cleaning up corners or smaller pockets.

The weight of the draghead maintains contact with the sea bed. The dredge pumps maintain the required flow that enables the disturbed material to be transported hydraulically as a slurry through the suction lines and the centrifugal pumps, from where it is discharged into the hopper on board or on an accompanying barge In the hopper, the solids settle out and the material is retained for transport to the disposal site and subsequent placement or dumping. Finer fractions of the dredged material overflow with the excess water from the hopper and settle to the seabed again.

The dredged material is then transported to where it is required (i.e. Port of Durban) and is discharged (please note that use of the dredge material within the Port will be subject to separate authorisations and is not included in the scope of this process).

There may be advantages to using separate dump barges rather than the TSHD sailing out to sea in that a pair of large barges could service a single dredger which would thus be able to continue with dredging operations on a more or less continuous basis, rather than to employ its time alternatively in dredging, sailing to and from the disposal site and discharging material. In

Figure 6 below provides an example of TSHD.

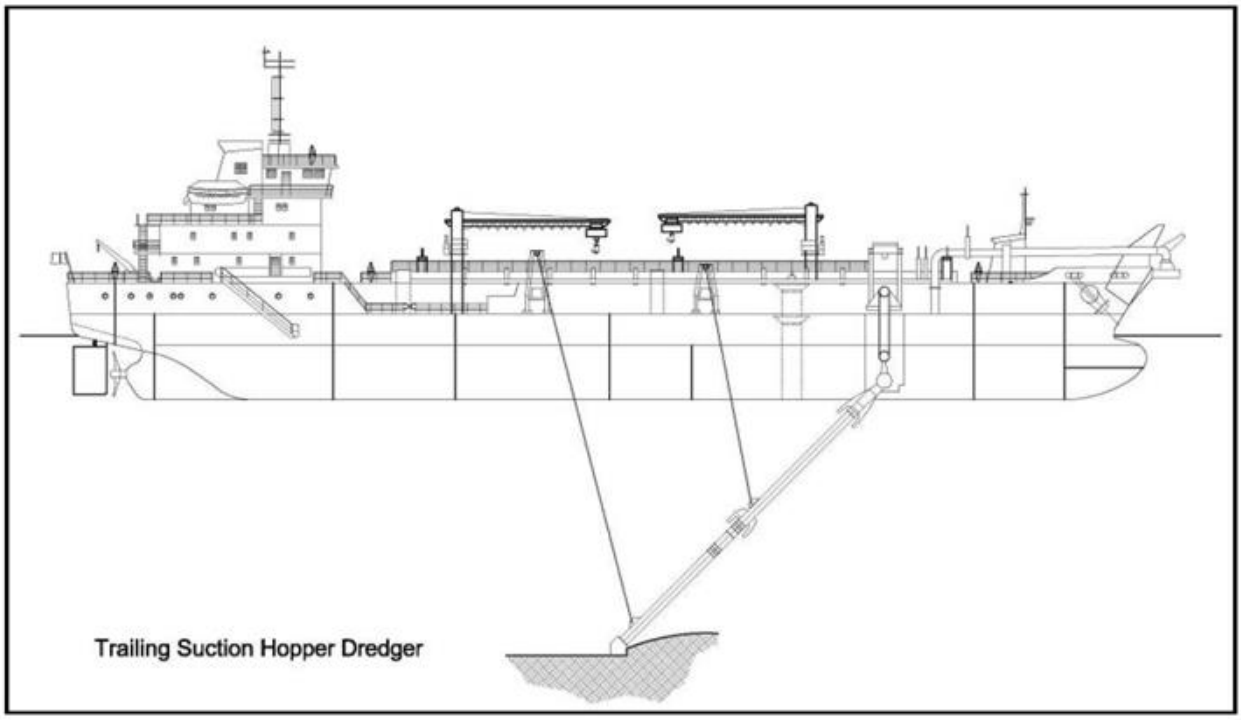


Figure 6: Example of Trailing Suction Hopper Dredger

7.3 Dredging Times

A single 2,700 m^3 TSHD/TSD has been proposed for offshore sandwinning. Although sandwinning will occur for a number of developments within the Port, these will not overlap and thus only one dredger will be required at a time.

An overview of one dredging cycle is provided in **Table 4**.

Table 4: Dredging Cycle Times

Description	Time
Sailing Distance at Sea	0.91 hours
Turning Time	0.25 hours
Dredging Time	1.50 hours
Dredging cycle time (not including time spent in the Port of Durban)	2.66 hours

7.4 Monitoring Measures

A separate EMPr will be put in place during the EIA Phase however in general, a number of monitoring requirements will be undertaken as part of the offshore sandwinning process. These include:

- A GPS record must be kept of the route followed by the hopper. This record must include:
  - Time of departure from the Port;
  - Route followed by the vessel to Sandwinning area (GPS track);
  - Time of arrival at Sandwinning area;
  - Position of the vessel at the time of starting to Sand Winning activities;
  - Heading and speed of the vessel at the time of starting to Sand Winning activities;
  - Position of the vessel at the time of completion of the Sand Winning Activities;
  - Heading and speed of the vessel at the time of completion of Sand Winning Activities;
  - Route followed by the vessel on the way back to the Port from the Sandwinning Site (GPS track); and
  - The daily track plot must be recorded electronically.
- The hoppers must have load indicator equipment on board to ensure that the hopper doors are not leaking and that no part of the load is being deposited anywhere other than in the Port.
- A matrix of the site must be set up to ensure there is even dredging distribution.
- The volumes of sand winning must be recorded.
- Turbidity monitoring must be undertaken as determined by specialist studies undertaken during the EIA Phase.

7.5 Associated Infrastructure and Services

There is no associated infrastructure and services required for the proposed offshore sandwinning activity. Existing services will be used within the Port where necessary. In

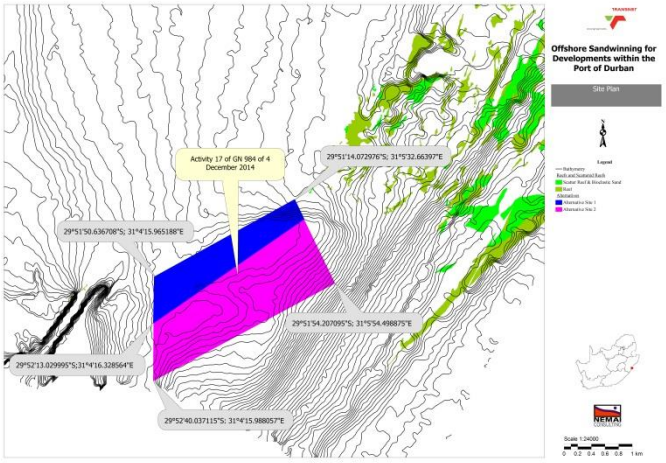
addition, due to the nature of the proposed activity, no specific construction camp for offshore sandwinning will be in place. Instead, management of site camps, ablutions, and landside waste will be authorised as part of the Port development activities which may include (but not limited to) the following:

- Pier 1 Phase 2 Expansion;
- Deepening and lengthening of the North Quay; and
- Berth reconstruction and deepening at Island View and Maydon Wharf.

7.6 Location of Proposed Activities

All activities related to the offshore sandwinning take place in the site described in **Table 5** below.

Table 5: Activities and Location*

Government Notice and Activity	Description	Location
GN R. 984 of 04 December 2014, Activity 17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	

7.7 Project Lifecycle

To adequately consider the impacts associated with the proposed offshore sandwinning the major activities during each phase of any project's life-cycle are listed in the sub-sections to follow.

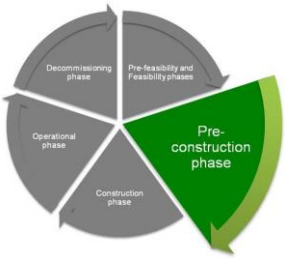
7.7.1 Feasibility Studies

During the Pre-feasibility and Feasibility Phases of the sandwinning process, the following activities were undertaken:

- Technical, economic and environmental screening of alternate footprints; and
- Geotechnical investigations (undertaken in 2001 by the Council of Geosciences for the proposed offshore sandwinning sites).

7.7.2 Pre- Construction Phase

During the Pre-construction Phase of the sandwinning process, the following activities will be undertaken:



- Obtain Environmental Authorisation; and
- Procurement process for Contractors.

The impacts associated with the above activities are addressed through mitigation measures contained in the Pre-construction Environmental Management Programme (EMPr).

7.7.3 Construction Phase

No construction is required in order to commence with offshore sandwinning activities.

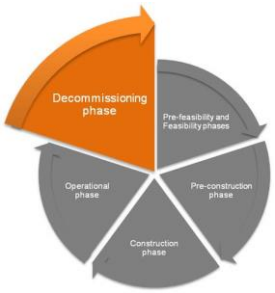
7.7.4 Operational Phase

During the Operational Phase of the sandwinning process, the following activities will be undertaken:

- Operation of TSD and TSHD for sandwinning;
- Maintenance of infrastructure; and
- Environmental monitoring of turbidity.

7.7.5 Decommissioning Phase

Please note that the current application is for the sandwinning or dredging of offshore material required for construction and maintenance of the Port of Durban for a period of 30 years. As such, this application does not deal with closure and rehabilitation as these aspects will be dealt with separately and in line with the current legislative requirements at the time.



8 LEGISLATION AND GUIDELINES CONSIDERED

8.1 Overview of Legislation

Some of the pertinent environmental legislation that has bearing on the proposed activity is discussed below and aims to satisfy 2(e) of Appendix 2 of GN No. R. 982 of 04 December 2014: A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

8.2 The Constitution

8.2.1 Summary

The Constitution of the Republic of South Africa, Act 108 of 1996, is the supreme law of the land and provides amongst others the legal framwork for legislation regulating coastal management in general. It also emphasises the need for co-operative governance. In addition, the Environmental clause in Section 24 of the Constitution provides that:

> *"Everyone has the right –*
>
> *a.) to an environment which is not harmful to their health or well being;*
>
> *b.) to have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:*
>
> *I. Prevent pollution and ecological degradation;*
> *II. Promotes conservation;*
> *III. Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development"*

8.2.2 Significance

The Constitution provides the overarching framework for sustainable development. It provides for protection of natural resources while promoting economic and social development.

8.3 The National Environmental Management Act (Act No. 107 of 1998)

8.3.1 Summary

The proposed offshore sandwinning requires authorisation in terms of the National Environmental Management Act (Act No. 107 of 1998), and the EIA will be undertaken in accordance with the EIA Regulations (2014) that consist of the following:

- EIA procedures - GN No. R. 982;
- Listing Notice 1 - GN No. R. 983;
- Listing Notice 2 - GN No. R. 984; and
- Listing Notice 3 - GN No. R. 985.

The project triggers activities under Listing Notices 2, and thus needs to be subjected to a Scoping and EIA process. The listed activities are explained in the context of the project in the table to follow.

Table 6: Listed Activities triggered by the proposed project

GN No. R.	Activity	Description as per GN	Applicability to the Project
GN R. 984 of 04 December 2014	17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	TNPA has recognized the need for sandwinning of approximately 4.5 million m^3 of offshore material which will be required as part of developments within the Port Two alternative sites are being assessed, Alternative Site 1 and Alternative Site 2, which are approximately 110 hectares and 250 hectares in extent respectively. In order to obtain the required volume of material from either alternative, sandwinning will proceed to approximately 4.1m in Alternative Site 1 and approximately 1.8m in Alternative Site 2.

Please note:

The use of offshore material in the Port of Durban will require a separate authorisation process. The activities included in this application form only relate to mining/sandwinning.

Furthermore, due to the nature of the proposed activity, no specific construction camp for offshore sandwinning will be in place. Instead, management of site camps, ablutions, and landside waste will be authorised as part of the Port development activities which may include (but not limited to) the following:

- Pier 1 Phase 2 Expansion;
- Deepening and lengthening of the North Quay; and
- Berth reconstruction and deepening at Island View and Maydon Wharf.

In addition to the Listed Activities contained within the Listed Notices, NEMA articulates principles such as “Polluter Pays” and “the Precautionary Principle”.

The Act also clarifies the competent authroity in regards to the application and notes the following:

> *The competent authority in respect of the activities listed in this part of the Notice is the compentent authority in the province in which the activity takes place , unless -*
>
> *b.) The Listed or specified activity is or is directly related to –*
>
> *(i) prospecting or exploration of a mineral or petroleum resource; or*
>
> *(ii) extraction and primary processing of a mineral or petroleum resources;*
>
> *In which case the competent authority is the Minister responsible for mineral resources.*

8.3.2 Significance

Authorisation for the offshore sandwinning requires authorisation in terms of NEMA and the 2014 EIA Regulations which regulate the EIA process. As the activity in question is contained in Listing Notice 2, a Scoping and EIA process is required. In addition, as the activity relates to extraction of a mineral (offshore sand/fill material), the competent authority is DMR.

8.4 Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)

8.4.1 Summary

The purpose of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources and to provide for matters related thereto. This act defines mining as "any operation or activity for the purposes of winning any mineral on, in or under the earth, water or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto".

In terms of the MPRDA, as amended, a mining permit applies when the mineral in question can be mined in 2 years and the area does not exceed 5 hectares. For larger areas a **mining right** will need to be applied for.

Important definitions of the MPDA include:

> ***'Land'*** *which includes the surface of the land and the sea, where appropriate.*

> ***'Mine'*** *when used as a verb, means any operation or activity for the purposes of winning an mineral on, in, or under the earth, water, or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto.*

> ***'Mineral'*** *means any substance, whether in solid, liquid or gaseous form, occurring naturally in or on the earth or in or under water and which was formed by subjected to a geological process and includes sand, stone, rock, gravel, clay, soil and any minerals occurring in residue stockpiles or residue deposits but excludes –*
>
> *a.) water, other than water taken from land or sea for the extraction of any mineral*
>
> *b.) petroleum; or*
>
> *c.) peat*

Based on the above definitions, offshore sandwinning is a mining activity.

GN 762 of 25 June 2004 of the MRPDA provides for exemptions of organs of state from certain provisions of the MRPDA. This notices exempts the National Ports Authority (now TNPA) from the provisions of Sections 16, 20, 22 and 27 of MRPDA in respect to any activity to remove any material for the construction and maintenance of dams, **harbours,** roads and railway lines…

However, Section 106(2) of the MPRDA was amended as follows: "*Despite subsection (1), the organ of state so exempted must submit relevant environmental reports required in terms of Chapter 5 of the National Environmental Management Act, 1998, to obtain an environmental authorisation*."

8.4.2 Significance

Based on this, a mining right will be required to win sand/mine material from an offshore sand winning area. TNPA is exempt from certain provisions of the MRPDA however an EIA process in terms of NEMA is still required. Based on this, an application for Environmental Authorisation has been submitted to DMR. In addition, an application in terms of Section 22 of MRPDA was also submitted.

8.5 The National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)

8.5.1 Summary

The National Environmental Management: Intergrated Coastal Management Act, 2008 (Act No 24 of 2008) aims to promote the coastal environment as well as to ensure that development and use of natural resources within the coastal zone is socially and economically justiable and ecologically sustainable.

An important definition is that of coastal waters:

> *Coastal waters means –*
>
> *a). marine waters that form part of the internal waters or territorial waters of the Republic referred to in Sections 3 and 4 of the Maritime Zones Act (Act No 15 of 1994); and*
>
> *b.) subjection to Section 26, any estuary.*

As can be seen in **Figure 7**, the terretorial zone is the area 12 nautical miles from the baseline. The proposed offshore sandwinning activity is proposed less than 1 nautical mile from the Port of Durban and thus fallls within this zone and within the definition of coastal waters.

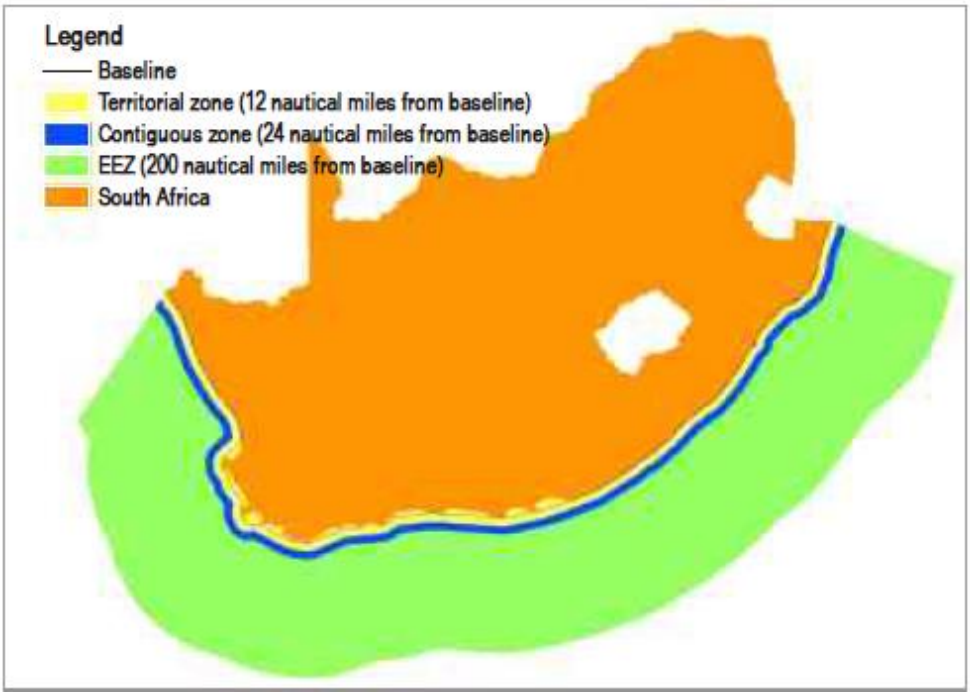


Figure 7: Maritime Zones (Celliers et al., 2009)

The Act has authority over coastal waters, and an organ of state that is legally responsible for controlling or managing any activity on or in coastal waters (marine waters that are part of South Africa's internal or territorial waters, and estuaries) must control or manage that activity:

- In the interests of the whole community; and
- According to South Africa's obligations (responsibilities) under international law

In addition to coastal waters, the proposed activity also falls within the areas known as coastal public property and the coastal zone (**Figure 8**).

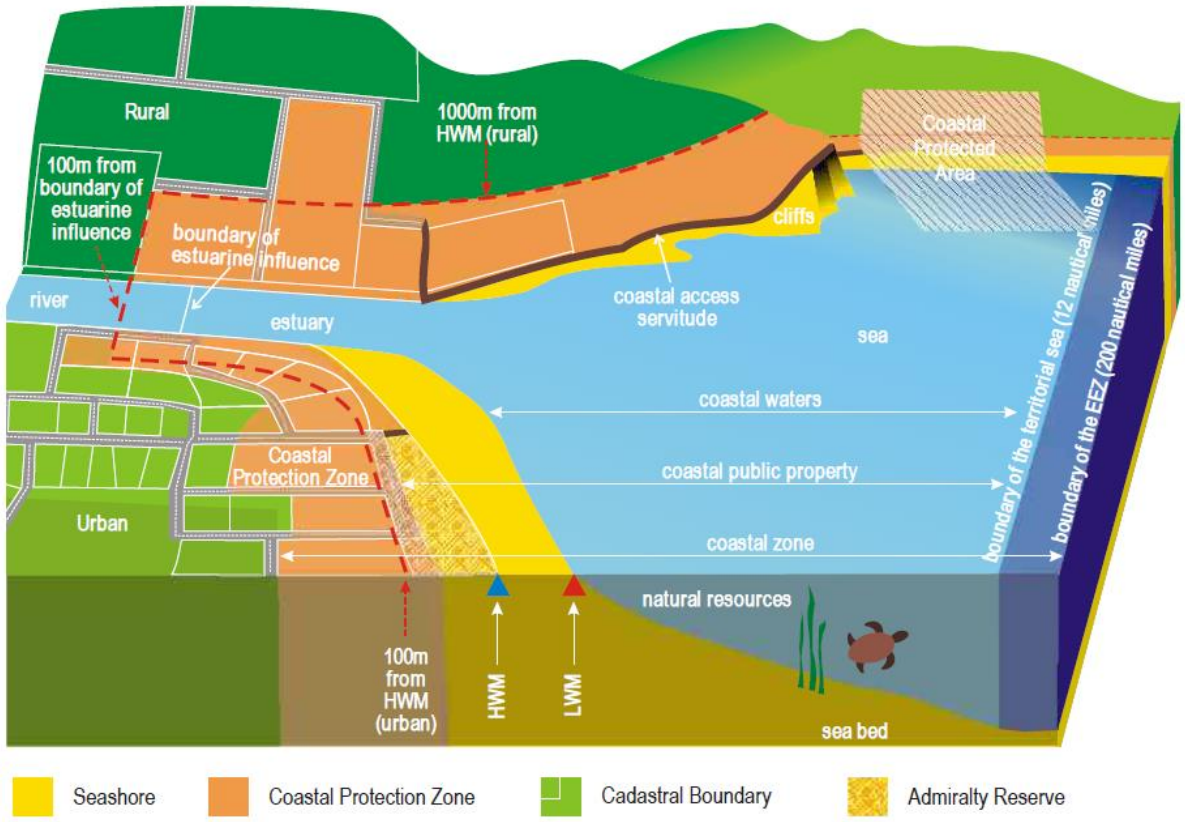


Figure 8: Maritime Zones (Celliers et al., 2009)

The Act stipulates that the State, in its capacity as the public trustee of all coastal public property must ensure that all ensure that coastal public property is managed, protected, conserved and enhanced in the interests of the whole community and also should take whatever reasonable legislative measures it considers necessary to conserve and protect coastal public property for the benefit of present and future generations.

The definition of Coastal Public Property (Section 7 of the Act) is as follows:

Coastal Public Property:

(a) coastal waters;

(b) land submerged by coastal waters, including—

(i) land flooded by coastal waters which subsequently becomes part of the bed of coastal waters; and

(ii) the substrata beneath such land;

(c) any island, whether natural or artificial, within coastal waters, but excluding—

(i) any part of an island that was lawfully alienated before this Act commenced; or

(ii) any part of an artificially created island (other than the seashore of that island) that is proclaimed by the Minister to be excluded from coastal public property;

(d) the seashore, but excluding—

(i) any portion of the seashore below the high-water mark which was lawfully alienated before the Sea-Shore Act,") 935 (Act No. 21 of 1935) took effect or which was lawfully alienated in terms of that Act and which has not subsequently been re-incorporated into the seashore; and

(ii) any portion of a coastal cliff that was lawfully alienated before this Act took effect and is not owned by the State;

(e) the seashore of a privately owned island within coastal waters; 20

(f) any admiralty reserve owned by the State;

(g) any state-owned land declared under section 8 to be coastal public property; or

(h) any natural resources on or in—

*(i) any coastal public property of a category mentioned in paragraph (a) to (8**)1** 25*

(ii) the exclusive economic zone, or in or on the continental shelf as contemplated in sections 7 and 8 of the Maritime Zones Act. 1994 (Act No. 15 of 1994), respectively: or

(iii) any harbour, work or other installation on or in any coastal public property of a category

Even though coastal public property is managed in the interest of the general public, in some instances the Minister may grant a coastal lease or concession to allow for some activities to take place on coastal public property, e.g. for a mariculture facility, pipeline or cable servitude. The Act specifies that no person may occupy any part of, or site on, construct or erect any building, road, barrier or structure on or in coastal public property unless under the authority of a coastal lease or concession.

No person may claim exclusive rights (private rights) to use any coastal resource that is part of, or derives from coastal public property, unless such a person:

- Is empowered to do so by national legislation;
- Is authorised to do so in terms of a coastal concession awarded by the Minister; or

- Is authorised to do so in terms of an authorisation issued under the Marine Living Resources Act (Act No. 18 of 1998).

8.5.2 Significance

No specific authorisation is required in terms of the the National Environmental Management: Intergrated Coastal Management Act, 2008 as no Dumping at Sea or Coastal Water Discharge Permit is required. In addition, should sandwinning be authorised it would be in terms of National Legislation (NEMA and MRPDA) and thus the rights to the land would be *empowered to do so by national legislation.* However the Scoping and EIA process will ensure that the DEA: Oceans and Coasts is involved throughout the process and that their requirements for the process are met. In addition, the EIA will need to determine the impacts to coastal water and coastal public property to ensure that these areas are managed in line with the Act.

8.6 The National Environmental Management Waste Act (Act No. 56 of 2008)

8.6.1 Summary

The National Environmental Management Waste Act (Act No. 56 of 2008) regulates waste management in order to protect the health and environment of South African citizens. This is achieved through pollution prevention, institutional arrangements and planning matters, national norms and standards and the licensing and control of waste management activities.

This act contains activities listed in Categories A and B that would require licensing from the provincial or national authorities and Category C activities which need to be managed in terms of the relevant Norms and Standards.

However the proposed activity does not include any waste management activities

8.6.2 Significance

No authorisation will be required in terms of the National Environmental Management: Waste Act (NEM: WA) (Act No. 59 of 2008), as the project will not include any listed waste management activities.

The EMPr will make suitable provisions for waste management, including the storage, handling and disposal of waste.

8.7 The National Water Act (Act No. 36 of 1998)

8.7.1 Summary

The National Water Act (Act No. 36 of 1998) regulates the surface and subsurface water of South Africa. Water is considered a scarce commodity and should therefore be adequately protected. Amongst other, the act deals with the protection of water sources, water uses, water management strategies and catchment management, dam safety and general powers and functions.

The purpose of the Act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled. The National Water Act includes the definition of a Water Resource as well as an Estuary.

*The National Water Act definition for a **Water Resource** includes:*

1.) A Watercourse;

2.) Surface Water;

3.) An Estuary; and

4.) An Aquifer

The National Water Act definition for an estuary is:

A partially or fully enclosed body of water –

a.) which is open to the sea permanently or periodically; and

b.) within which the sea water can be diluted to an extent that is measurable with fresh water drained from the land.

8.7.2 Significance

The Act does not deal with the management of coastal waters. As mentioned previously this process does not deal with activities within the Estuary as the use of the infill material obtained from offshore sandwinning will be governed by a separate process.

8.8 The Marine Living Resources Act (Act No 18 of 1989)

8.8.1 Summary

The Marine Living Resources Act, 1989 (Act No. 18 of 1989) (MLRA) aims to provide for the conservation of the marine ecosystem, the long term sustainable utilisation of marine living resources, the orderly access to exploitation, utilisation and protection of certain marine living resources and to provide for the exercise of control over marine living resources in a fair and equitable manner to the benefit of all citizens of South Africa. These aims are directly dependent on the healthy functioning of estuaries and thus the impacts of developments on estuaries as well as Marine living resources needs to be acertained.

The MLRA applies to all persons on, or in South African waters.

South African Waters includes the seashore, internal waters, territorial waters, the exclusive economic zone and such waters as tidal lagoons and tidal rivers in which the rise and fall of the water level takes place as a result of the tides.

8.8.2 Significance

The main implication of this Act, is the sustainable utilisation of marine resources.

8.9 The Seashore Act (Act No. 21 of 1935)

8.9.1 Summary

The Seashore Act, 1935 (Act No 21 of 1935) regulated the use and pollution as well as the removal of material from the sea and shore. This act was repealed in its entirety by the National Environmental Management: Integrated Coastal Management Act, 2008. The Seashore Act, is still discussed in the Durban Bay Estuary Management Plan – Situational Analysis and as such is worth mentioning.

8.9.2 Significance

As the Act has been repealed in its entirety by NEM:ICM it is not significant. It has been included for background purposes only.

8.10 The Sea Birds and Seals Act (Act No. 46 of 1973)

8.10.1 Summary

The Sea birds and Seals Act, 1973 (Act No. 46 of 1973) provides protection for various seabirds along the South African coast including estuaries.

8.10.2 Significance

The main implication of this Act is the protection of seabirds. Impacts on seabirds was assessed as part of the Marine Impact Assessment.

8.11 The National Environmental Management: Biodiversity Act (Act No 10 of 2004)

8.11.1 Summary

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) was promulgated for the management and conservation of South Africa's biodiversity through the protection of species and ecosystems and the sustainable use of indigenous biological resources.

8.11.2 Significance

The main implication of this Act is the protection of biodiversity. Impacts of the proposed activity on biodiversity was assessed as part of the Marine Impact Assessment..

8.12 The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

8.12.1 Summary

The aim of the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural seascapes. The purpose of a Protected Environment is amongst others to protect a specific ecosystem outside a special nature reserve world heritage site or nature reserve and also to ensure the use of the natural resources in the area is sustainable.

8.12.2 Significance

The area identified for sandwinning is not in a protected area and therefore this Act is not applicable.

8.13 The National Heritage Resources Act (Act No. 25 of 1999)

8.13.1 Summary

The National Heritage Resources Act (Act No. 25 of 1999) was promulgated for the protection of National Heritage Resources and the empowerment of civil society to conserve their heritage resources.

In terms of Section 38 of this act, certain listed activities require authorisation from provincial agencies:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m^2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent.

The National Heritage Resources Act, 1999 protects both buildings and shipwrecks that are older than 60 years old. A permit may be required from SAHRA should the need arise to disturb or damage any historic shipwrecks however at this point no permits are necessary. Further, during the Channel Widening and Deepening Project, studies were done to determine the location of shipwrecks. These will be checked against the areas of development for this project.

Other relevant legislation which incorporates submerged archaeological sites is described in the following acts:

- Merchant Shipping Act, 1951 (Act No, 57 of 1951);
- Customs and Excise Act, 1964 (Act No 91 of 1964); and
- Legal Succession to the South African Transport Services Act, 1989 (Act No 9 of 1989).

The above legislation mainly deals with the sites of shipwrecks and with shipwrecks and their contents without any reference to any cultural or historical value. Only the NHRA specifically acknowledges the value of shipwrecks in terms of cultural or historical context.

Specifically, Section 35 (1) states that "The protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of the South African Heritage Resource Agency (SAHRA)".

8.13.2 Significance

Due to the large footprint of the Offshore Sand Winning sites, a Underwater Heritage Impact Assessment was undertaken to determine any impacts to heritage resources such as shipwrecks.

8.14 The National Ports Act (Act No 12 of 2005)

8.14.1 Summary

The National Ports Act (NPA), 2005 (Act No. 12 of 2005) is the primary piece of legislation regulating the port sector in South Africa. It specifically deals with the modernisation and efficient operation of South African ports. TNPA must regulate and control development, in accordance with approved port development frameworks, integrate biophysical, social and economic issues in all forms of decision making and ensure sustainable and transparent planning processes, in consultation with stakeholders.

The objective of the Ports:

"To promote the development of effective and productive South African ports Industry that is capable of contributing to the economic growth and development of South Africa"

Section 69 of the NPA deals with the protection of the environment and requires that TNPA achieves a balance between the protection of the environment and the establishment, development and maintenance of ports as well as ensuring the sustainable and transparent port planning processes are undertaken when formulating any port development framework. Amongst others the NPA requires that TNPA regulate and control pollution within the port limits.

8.14.2 Significance

TNPA is required by the NPA to promote economic development of the Port as such developments within the Port are planned and require sandwinning for infill material. Further, a balance between environmental protection and economic development must be achieved.

8.15 The National Environmental Management: Air Quality Act (Act No 39 of 2004)

8.15.1 Summary

The National Environmental Management: Air Quality Act 39 of 2004 provides for the setting of national norms and standards for regulating air quality monitoring, management and control and describes specific air quality measures so as to protect the environment and human health or well-being by:

- preventing pollution and ecological degradation; and
- promoting sustainable development through reasonable resource use.

It also includes the establishment of national ambient dust fall out levels that may be relevant to the construction.

8.15.2 Significance

No impacts to air quality are expected as the infill material will remain suspended in sea water within the dredger and will not result in dust. No Air Emissions Licence will be required.

8.16 The Occupational Health and Safety Act (Act No 85 of 1993)

8.16.1 Summary

The Occupational Health and Safety Act, 1993 (Act No.85 of 1993) provides for the health and safety of people at work as well as the health and safety of persons using plant and machinery.

8.16.2 Significance

Transnet will be required to meet the requirements of the OHS Act during the offshore sandwinning of infill material.

8.17 The National Health and Safety Act (Act No 61 of 2004)

8.17.1 Summary

The National Health Act, 2004 (Act No. 61 of 2004) provides measures for the promotion of health of citizens of South Africa and is administered by the Department of Health. The Act has impact on the port in that pollution of marine resources can have impacts of human health.

The Act also provide for Municipal Health Services which include:

- Water quality monitoring;
- Waste management;
- Health surveillance of premises;
- Environmental pollution control; and
- Chemical safety

8.17.2 Significance

The EMPr will take into account management of waste and pollution so that marine resources are not negatively impacted.

8.18 The KZN Conservation Management Act (Act No 9 of 1997)

8.18.1 Summary

The KZN Conservation Management Act, 1997 (Act No 9 of 1997) provides for the establishment of the KZN Conservation and prescribes its powers, duties and functions which include:

- Direct Nature conservation management; and
- Direct Protected areas management.

This is currently carried out by Ezemvelo KZN Wildlife (EKZNW).

8.18.2 Significance

EKZNW does not have a mandate within the coastal waters as the proposed activity does not occur within a protected area. However, EKZNW will be involved in the Scoping and EIA process and will be provided with a copy of the Scoping and EIA reports for review and comment.

8.19 Policy, Programmes and Plans

8.19.1 eThekwini Integrated Development Plan

The Municipal Systems Act, 2000 (Act No. 32 of 2000) requires that local government structures prepare Integrated Development Plans (IDPs) to serve as tools for facilitation and management of development. The IDP (2011) highlights the Port of Durban as an economic investment area that requires major investment. The development of the Port as an economic, manufacturing and trading hub and its promotion as a gateway port to the east is prioritised. However, the IDP also highlights the importance of balancing the physical, social and economic benefits of the coastal area.

8.19.2 Significance

Developments within eThekwini should be aligned with eThekwini Integrated Development Plan (IDP). The Scoping report has taken into account the IDP.

8.19.3 Offshore Marine Protected Area Project

Only 0.4% of South Africa's mainland marine territory is protected within Marine Protected Areas (MPAs) and most offshore habitat types are unprotected. The offshore expansion of South Africa's MPA network is a national priority. A collaborative five-year Offshore Marine Protected Area project was undertaken to support the identification of a network of potential offshore spatial management measures including MPAs. The network aims to represent offshore biodiversity, protect vulnerable marine ecosystems, contribute to fisheries sustainability, support the management of bycatch, and provide for research and monitoring. The implementation of offshore spatial management measures can secure remaining healthy offshore habitats, prevent further habitat damage, support stock recovery, and the sustainability of our fisheries and advance integrated ecosystembased management of South Africa's marine territory.

The closest focus area to the study site was the Tugela Banks area which is approximately 45 km north east of the proposed offshore sandwinning sites. The area was identified as a zoned Marine Protected Area and industry –specific fisheries or bycatch management areas should be considered for implementation in this area. Unprotected pelagic and seabed habitats (such as Natal shelf muds and gravels and submarine canyons) warrant protection in this area which has complex sedimentary patterns and complex oceanography. This area is highly productive and serves a nursery area for many species. This focus area was also identified by finescale planning conducted in KwaZulu-Natal through the SeaPlan project led by Ezemvelo KZN Wildlife.

8.19.4 Significance

The proposed project footprint does not form part of any offshore marine protected focus area.

8.19.5 The South African National Spatial Biodiversity Assessment: Marine Component

This report presents a spatial assessment of the conservation status of selected marine biodiversity patterns in South Africa, at a national scale. It addresses a subset of marine species, and broad scale intertidal and subtidal habitats (within South African waters, to the Exclusive Economic Zone - EEZ). The report is useful for improving biodiversity management in the marine environment.

The report noted a number of Marine Protected Areas (MPAs) however the closest of these (the Aliwal Shoal Controlled Zone, Aliwal Shoal Crown Area Restricted Zone and the Aliwal Shoal Produce Restricted Zone) are approximately 44 km's south west of the proposed

8.19.6 Significance

The proposed project footprint does not form part of any offshore MPA.

8.20 Climate Change Policies and Guidelines

8.20.1 The United Nations Framework Convention on Climate Convention (UNFCCC)

The UNFCCC is the foundation of global efforts to combat global warming. Opened for signature in 1992 at the Rio Earth Summit, its ultimate objective is the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

The Convention also sets out some guiding principles which include the precautionary principle (the lack of full scientific certainty should not be used as an excuse to postpone action when there is a threat of serious or irreversible damage) as well as the principle of the 'common but differentiated responsibilities' (which assigns the lead in combating climate change to developed countries). Other principles deal with the special needs of developing countries and the importance of promoting sustainable development.

Both developed and developing countries accept a number of general commitments. All Parties will develop and submit national communications containing inventories of greenhouse gas emissions by source and greenhouse gas removals by sinks.. They will adopt national programmes for mitigating climate change and develop strategies for

adapting to its impacts. They will also promote technology transfer and the sustainable management, conservation, and enhancement of greenhouse gas sinks and .reservoirs. (such as forests and oceans). In addition, the Parties will take climate change into account in their relevant social, economic, and environmental policies; cooperate in scientific, technical, and educational matters; and promote education, public awareness, and the exchange of information related to climate change.

8.20.2 The Conference of the Parties (COP)

The supreme body of the Convention is the Conference of the Parties (COP). The COP comprises all the states that have ratified or acceded to the Convention (185 as of July 2001). It held its first meeting (COP-1) in Berlin in 1995 and will continue to meet on a yearly basis unless the Parties decide otherwise. The COP's role is to promote and review the implementation of the Convention. It will periodically review existing commitments in light of the Convention' s objective, new scientific findings, and the effectiveness of national climate change programmes. The COP can adopt new commitments through amendments and protocols to the Convention.

8.20.3 The Kyoto Protocol

The Kyoto Protocol to the UNFCC aims to strengthen the international response to climate change. Adopted by consensus at the third session of the Conference of the Parties (COP-3) in December 1997, it contains legally binding emissions targets for Annex I (industrialized) countries. By arresting and reversing the upward trend in greenhouse gas emissions that started in these countries 150 years ago, the Protocol promises to move the international community one step closer to achieving the Convention's ultimate objective of preventing dangerous anthropogenic interference with the climate system.

8.20.4 International Maritime Organisation Regulatory Framework

While emissions from aviation and maritime transport have been part of the UNFCCC agenda for some time, ***these emissions are not included under the Kyoto Protocol***. Article 2.2 of the Kyoto Protocol reads:

"The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization [ICAO] and the International Maritime Organization [IMO], respectively".

In other words, GHG emissions associated with the maritime sector are not included in GHG reduction targets agreed to by Annex I countries (IMO, 2009). Similarly, the *2006 Intergovernmental Panel for Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* excludes GHG emissions associated with the international aviation and maritime sectors from national GHG inventories. The *GHG Inventory South Africa 1990 to*

2000, compiled in accordance with the IPCC 2006 guidelines, includes international aviation and maritime bunker fuel emissions as memo items.

South Africa's proposed mechanisms for addressing its national GHG emissions footprint i.e. the national GHG reduction targets described in the 2011 Climate Change Response White Paper and associated enabling initiatives (such as the proposed Carbon Budget for the Transport Sector) are consequently expected to *exclude* consideration of international aviation and maritime emissions. SA's proposed Carbon Budget for the Transport Sector will in all probability adopt the same scope as the IPCC 2006 guidelines and therefore limit itself to road, rail and pipeline GHG emissions only.

This is based on the assumption that the South African government will continue to support the status quo whereby international maritime and aviation emissions are managed via the ICAO and IMO, as stipulated in the Kyoto Protocol. It is noted, however, that while progress by the IMO in tackling GHG emissions is greater than that achieved by the ICAO, certain countries as well as the European Union (EU) feel that the progress falls short of what is ultimately needed. These nations are increasingly calling for international maritime emissions to be included in their own national GHG emission targets, in order to enforce more aggressive mitigation measures.

8.20.5 The National Climate Change Response White Paper, 2011

The National Climate Change Response White Paper (2011) presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. The response details South Africa's response to climate change which has two objectives:

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.
- Make a fair contribution to the global effort to stabilise GHGs concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

The response is guided by the principles set out in the Constitution, the Bill of Rights, NEMA, the Millennium Development Goals (MDGs) and the UNFCCC. The principles include, amongst others:

- Common but differentiated responsibilities and respective capabilities – aligning our domestic measures to reduce the country's GHG emissions and adapt to the adverse effects of climate change with our unique national circumstances, stage of development and capacity to act.

- Equity – ensuring a fair allocation of effort, cost and benefits in the context of the need to address disproportionate vulnerabilities, responsibilities, capabilities, disparities and inequalities.
- Special needs and circumstances – considering the special needs and circumstances of localities and people that are particularly vulnerable to the adverse effects of climate change, including vulnerable groups such as women, and especially poor and/or rural women; children, especially infants and childheaded families; the aged; the sick; and the physically challenged.
- Uplifting the poor and vulnerable – climate change policies and measures should address the needs of the poor and vulnerable and ensure human dignity, whilst endeavouring to attain environmental, social and economic sustainability.
- Intra- and Inter-generational sustainability – managing our ecological, social and economic resources and capital responsibly for current and future generations.
- The Precautionary Principle – applying a risk-averse and cautious approach, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- The Polluter Pays Principle – those responsible for harming the environment paying the costs of remedying pollution and environmental degradation and supporting any consequent adaptive response that may be required.
- Informed participation – enhancing public awareness and understanding of climate change causes and impacts to promote participation and action at all levels.
- Economic, social and ecological pillars of sustainable development – recognising that a robust and sustainable economy and a healthy society depends on the services that well-functioning ecosystems provide, and that enhancing the sustainability of the economic, social and ecological services is an integral component of an effective and efficient climate change response.

8.20.6 The Provincial Policy Context

In 2008 a Provincial vulnerability assessment study was commissioned to provide information for the planning and development of Climate Change adaptation and mitigation implementation strategy in KwaZulu-Natal. The findings of the study provided insight on the following:

- The potential impacts and vulnerabilities of the various sectors;
- Strategic issues of concern, areas at risk, gaps and uncertainties and available information on climate change; and
- Existing initiatives and activities that are aimed at mitigating the consequences of climate change and to identify potential opportunities for climate change projects.

In addition, a cabinet resolution was passed on 13 August 2010 that the Department of Agriculture, Environmental Affairs and Rural Development (DAERD) should report on Climate Change Forecasting and Planning. The resolution noted that changes in climatic trends over the KwaZulu-Natal region are being observed and that these trends are consistent with climate change projections (such as observed warming trends in the north-eastern, Midlands and south coastal parts of the province and wetting trends have been observed over parts of the region during February).

In September 2012, the KwaZulu-Natal Provincial Government became the first provincial government to establish a Climate Change and Sustainable Development Council, which boosts multi-stakeholder membership. The Council has set up three Working Groups, namely Policy and Regulatory Alignment Working Group; Adaptation and Mitigation Working Group and Renewable Energy Working Group.

Since its inception the Council has had several meetings and initiated a number of bi-laterals agreements with foreign governments. The Council participated at the Rio+20 Sustainable Development in 2011 and also at the COP18 at Doha, Qatar. The Council aims to pursue localization of manufacturing of renewable energy plant components, and also encourages tertiary institutions to pursue more vigorously Innovation, science and technology in the green industries related sectors.

The province is also in the early stages of developing the Climate Change Response and Sustainable Development Plan.

The KwaZulu-Natal Provincial Government is also working closely with the United Nations (UNIDO) and United Nations Development Programme (UNDP) in rolling out the Sustainable Energy for All Programme (SE4ALL) in the Province, including the implementation of the following activities:

- biomass-to-energy project;
- mini-grid project;
- a timber hub;
- electricity retrofitting in government buildings; and
- KZN renewable energy innovation centre and manufacturing hub.

In 2012, the KwaZulu-Natal provincial government was accepted as one of the member regional governments of The Climate Group. The membership has afforded KwaZulu-Natal an opportunity to observe best international practice on innovative and sustainable climate change response programmes. To this end, various KwaZulu-Natal delegations have participated in important international dialogues since becoming members, including

- Showcasing technological innovations in the various regions by members of the States and Regions Alliance and deliberating on the 2012 Programme of Action

for the Alliance at the States and Regions General Assembly meeting at the City of Vitoria, the Basque Country, Spain in March 2012;

- A Business for Environment (B4E) conference hosted in Berlin, Germany to explore greater SME involvement in the green economy in May 2012; and
- Government and business summits, including the international launch of The Clean Revolution Campaign, Rio+20 Conference in Rio, Brazil – June 2012.

8.20.7 eThekwini Policy

eThekwini Metropolitan Municipality is one of the front runners in the country when it comes to understanding and planning for Climate Change in the region. In addition to a number of studies and reports, the Durban Climate Change Strategy (eThekwini Metropolitan Municipality, 2014) has been influential in managing Climate Change in the region.

The Metropolitan is also a signatory of the Durban Adaptation Charter (DAC) which was a key output of the *Durban Local Government Convention: adapting to a changing climate – towards COP17/CMP7 and beyond* (2-4 December 2011) which ran concurrently with the United Nations Framework Convention on Climate Change (UNFCCC) COP17/CMP17 held in Durban, South Africa (28 November - 9 December 2011). The DAC was signed by 107 mayors and elected officials representing over 950 local governments. The aim of the DAC was to complement existing local government climate change initiatives, such as the Mexico City Pact (signed prior to COP16/CMP6) and the associated *carbonn Climate Registry*. Together they provide a holistic vision for transforming the world's cities and local governments and making them more 'climate smart'. The streamline reporting effort, DAC signatory cities report on their adaptation actions using the *carbonn Climate Registry*.

8.20.8 Climate Change Policy Framework for State Owned Companies

In 2011, the Department of Public Enterprises (DPE) released its climate change policy framework for state owned companies (SOCs), including Transnet. The framework is intended to "*provide direction to the Boards and management of SOCs in relation to the accomplishment of the goals that have been articulated in the October 2011 National Climate Change Response White Paper*". It is also intended to guide longer term actions required to put South Africa on a low carbon development path and to ensure that SOCs are leading as agents of change in this process.

The overarching approach is based on four core principles which underline the design of the DPE policy:

- SOCs should focus on optimising the overlap between commercial, economic, developmental and environmental objectives whilst carefully managing areas where these objectives conflict.

- Climate change, broader environmental and green economy considerations must be integrated into the heart of SOC planning, procurement and operational processes (while acknowledging that this will be an on-going process of learning).
- Each SOC requires flexibility in the way it responds to the challenges of climate change given the diversity of sectors within which the SOC operates.
- The development of the green economy requires a high level of collaboration across SOCs and between SOCs and government.

Whilst the Framework does not provide much detail, it clearly commits all SOCs to actively contribute to the national climate change response goals related to both adaptation and mitigation.

8.20.9 Transnet Policy

Transnet is at the initial stage of developing an integrated strategic response to climate change. In its voluntary submission to the CDP Investor Response for 2011, Transnet indicated that the following activities have been concluded:

- High Level Risk and Vulnerability Assessment;
- GHG Emission Inventory 2011/2012;12; and
- General mitigation roadmap.

In addition, Transnet is part of the Industry Task Team on Climate Change (ITTCC), a voluntary non-profit association established to undertake fact-based technical work on climate change and to work with Government to find optimal solutions for achieving a sustainable, low carbon economic growth path for South Africa.

8.20.10 Significance of various plans and policies

The operation of the mining site does not directly impact on climate change however mitigation measures to minimise emissions related to the dredgers will be included in the Sandwinning EMPr.

8.21 Guidelines

The following guidelines were used in the preparation of this report.

- Assessment of alternatives and impacts (Guideline 5) in support of the EIA Regulations, Department of Environmental Affairs and Tourism, Pretoria (DEAT, 2006);
- Celiers, L., Breetzke, T., Moore, L., and Malan, D. 2009. A User-friendly Guide to South Africa's Integrated Coastal Management Act. DEA and SSO Engineers and Environmental Consultants, Cape Town, South Africa;

- Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005. Integrated Environmental Management Guideline Series (DEAT, 2005a);
- Guideline 4: Public Participation, in support of the EIA Regulations. Integrated Environmental Management Guideline Series (DEAT, 2005);
- Guideline on Alternatives: NEMA Environmental Impact Assessment Regulations (prepared by the Western Cape Department of Environmental Affairs and Development Planning, 2006);
- Guideline on Need and Desirability, NEMA Environmental Impact Assessment Regulations Guideline and Information Document Series. Department of Environmental Affairs and Development Planning (DEADP, 2009);
- Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- Guideline for Environmental Management Plans (Lochner, P. 2005);
- Guideline for determining the scope of specialist involvement in EIA processes (Münster, 2005);
- Guideline for involving biodiversity specialists in EIA processes (Brownlie, 2005);
- Guideline for involving heritage specialists in EIA processes (Winter & Baumann, 2005);
- Guideline for the review of specialist input in EIA processes (Keatimilwe & Ashton, 2005);
- PIANC Dredging and Port Construction around Coral Reefs (UNEP, 2010);
- Environmental Considerations for Port and Harbour Developments. (World Bank, 1990);
- IAPH. Guidelines for environmental Planning and Management in Ports and Coastal Area Developments (COPSEC, 1989);
- UK Marine SACs Project. Task 2.1: Recreational User Interactions. Framework for Reviewing and Managing Potential Recreational Impacts on Annex I and II Features Within UK Marine Special Areas of Conservation. (ABP Research, 1999);
- UK Marine SACs Project. Task 2.2: Port and Harbour Operations. Good Practice Guidelines for Ports and Harbours Operating Within or Near UK Marine Special Areas of Conservation. (UK CEED, 1999); and
- Guidelines for Port Environmental Management (Paipai, 1999).

8.22 International Conventions

The following international conventions, commissions and regulations were also taken into account where necessary:

- International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL);
- Amendment of the International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL) (Bulletin 567 – 2/08);
- United Nations Convention on Law of the Sea, 1982 (UNCLOS);
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Convention) and the 1996 Protocol (the Protocol);
- International Convention relating to Intervention on the High Seas in case of Oil Pollution Casualties (1969) and Protocol on the Intervention on the High Seas in Cases of Marine Pollution by substances other than oil (1973);
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1989);
- Convention on Biological Diversity (1992).
- Carriage of Goods by Sea Act, 1986 (No. 1 of 1986);
- Hazardous Substances Act, 1983 and Regulations (No. 85 of 1983);
- Marine Traffic Act, 1981 (No. 2 of 1981);
- Marine Pollution (Control and Civil Liability) Act, 1981 (No. 6 of 1981);
- Marine Pollution (Prevention of Pollution from Ships) Act, 1986 (No. 2 of 1986);
- Marine Pollution (Intervention) Act, 1987 (No. 65 of 1987);
- Maritime Safety Authority Act, 1998 (No. 5 of 1998);
- Maritime Safety Authority Levies Act, 1998 (No. 6 of 1998);
- Maritime Zones Act 1994 (No. 15 of 1994);
- Merchant Shipping Act, 1951 (No. 57 of 1951);
- Mine Health and Safety Act, 1996 (No. 29 of 1996);
- National Nuclear Energy Regulator Act, 1999 (No. 47 of 1999);
- Ship Registration Act, 1998 (No. 58 of 1998);
- South African Maritime Safety Authority Act, 1998 (No. 5 of 1998);
- South African Maritime Safety Authority Levies Act, 1998 (No. 6 of 1998); and
- Wreck and Salvage Act, 1995 (No. 94 of 1995).

9 SCOPING AND EIA PROCESS

9.1 EIA Listed Activities (04 December 2014)

The proposed activity entails certain activities that require authorisation in terms of NEMA. Refer to Section 7 for further discussion on the legal framework.

The process for seeking authorisation is undertaken in accordance with the EIA Regulations (GN No. R. 982, R. 983, R. 984 and R. 985 of 04 December 2014), promulgated in terms of Chapter 5 of NEMA.

Based on the activity triggered involved which include activities listed in GN No. R. 984 of 04 December 2014 the requisite environmental assessment for the project is a Scoping and EIA process.

9.2 Competent Authority

In terms of the Regulations, the lead decision-making authority for the Scoping and EIA is the DMR as the activity in question is mining related.

9.3 Application Form

The Application for Environmental Authorisation (EA) for the proposed activity was submitted to DMR and the reference number KZN30/5/1/1/2/00070BP was received. Refer to **Appendix 4** for a copy of the Application Form.

9.4 Formal Process

The environmental assessment process is divided into two phases, namely: 1) Scoping and 2) EIA. An outline of the Scoping and EIA process for the proposed offshore sandwinning is provided in **Figure 9**.

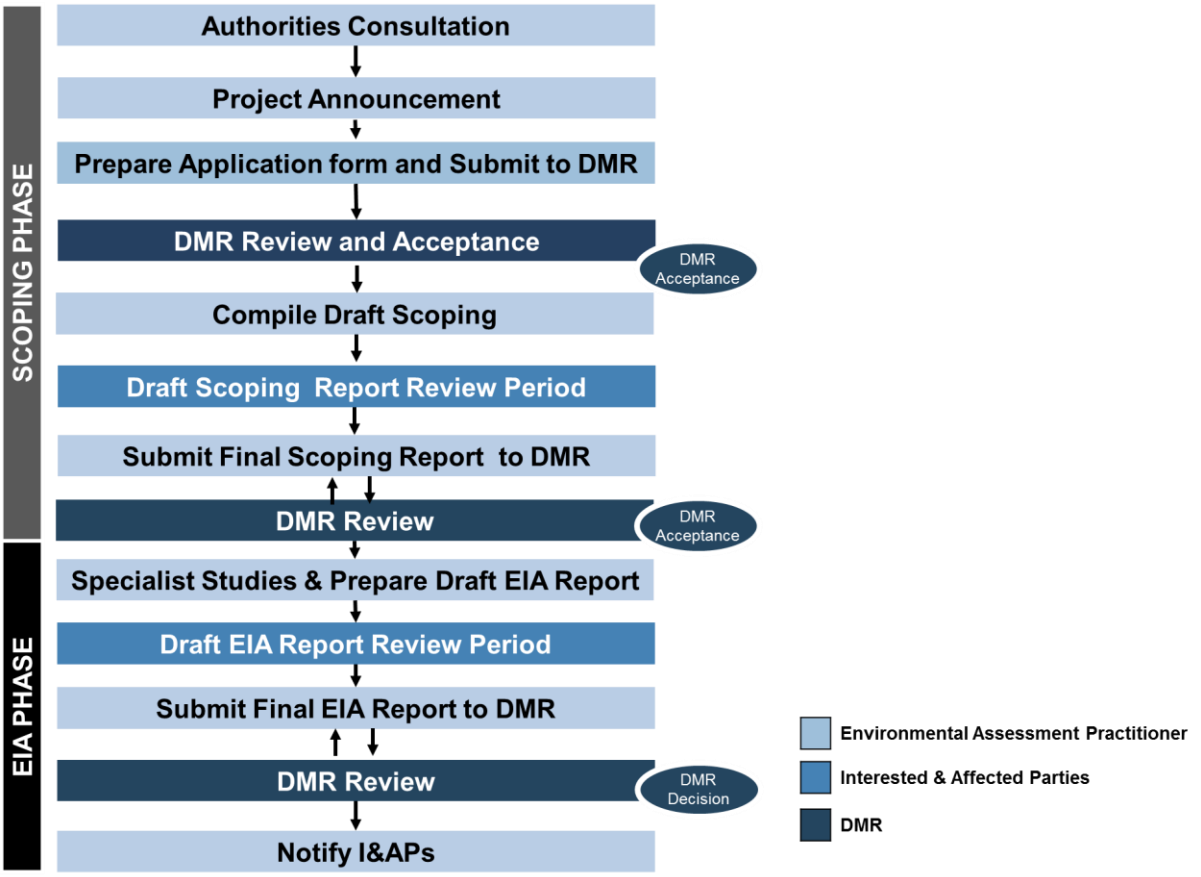


Figure 9: Scoping and EIA Process

9.5 Scoping Phase

The purpose of Scoping, which constitutes the first phase of the formal EIA process, is as follows:

1. Introduce the proposed project to all Interested and Affected Parties (IAPs);
2. Engage with IAPs to allow for participation in the process that is transparent, cooperative, informative and robust. Allow for informed decision-making with regard to the EIA process;
3. Identify the significant issues and impacts to be investigated further during the execution of the EIA phase;
4. Consider suitable and feasible alternatives for achieving the project's objectives; and
5. Determine the scope of the ensuing EIA phase in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives.

In order to meet the above, the DSR will provide the following:

- Motivation on the Need and Desirability of the proposed development;
- Clarity on the roles and responsibilities of the various stakeholders in the project;

- Information on the Public Participation Process;
- Information on the Scoping and EIA processes;
- Description on how the proposed development will be undertaken (if approved);
- Information on the legislation that has been considered;
- Information on the Receiving Environment that could be affected by the proposed project;
- Information on Alternatives which are being considered;
- Proposed methodology of assessing the potential impacts during the EIA Phase;
- Findings on the type of Specialist Studies required in the pending EIA Phase; and
- Proposed Plan of Study for the pending EIA Phase of the project.

9.6 EIA Phase

The EIA phase, which constitutes the second phase of the formal EIA process, serves to follow from the Scoping phase and will provide the following:

- A detailed description of the proposed development and location;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process will be described;
- The Comments and Responses Report and Stakeholder Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;
- A summary of the findings of the specialist studies (Copies of all specialist reports appended to the EIA report);
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An Environmental Management Programme (EMPr) that complies with Appendix 4 of GN No. R. 982; and
- Any further information that will assist in decision making by the authorities.

9.7 Landowner Notification

The proposed activity occurs off the east coast of South Africa (approximately 1.2km east of Port of Durban) as such there is no landowner, occupiers or tribal authorities etc. to be notified. In addition, there are no powerlines, public roads or railway lines within 100m of the site. The location of services such as cables will be determined during the Scoping and EIA process and should they occur within 100m of the site, responsible authorities will be notified.

A detailed IAP database was compiled and includes authorities with jurisdiction in the area such as the DEA, the Department of Agriculture, Forestry and Fisheries (DAFF), the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA) and EKZNW. The database will also include non-governmental organisations such as WESSA, Coastwatch, Earthlife Africa and Birdlife Port Natal as well as people and organisations who formed part of the Berth 203 to 205 Expansion EIA IAP database and the Durban Bay Estuary Management Plan IAP Database.

10 Assumptions and Limitations

The following assumptions and limitations apply to this Scoping exercise:

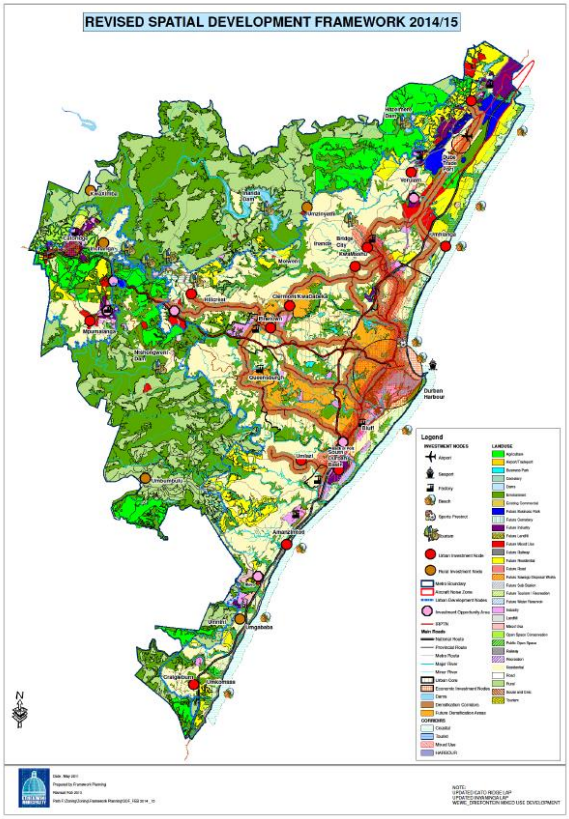
- In accordance with the purpose of Scoping, the report does not include detailed specialist investigations on the receiving environment, which will only form part of the EIA Phase. The environment in the project area was primarily assessed in the Scoping Phase through site visits, desktop screening, incorporating existing information from previous studies, and input received from IAPs;
- The GIS versions of data available for the public are assumed to be the latest information provided by the Departments (such as SANBI);
- It is assumed that only one dredger will visit the sandwinning site at a time;
- This Scoping and EIA is confined to the scope of works inside the proposed site boundary (i.e. related to offshore sandwinning). The scope of work related to the use of the dredged material is not included and may require separate authorisation.

11 Need and Desirability

In terms of 2 (f) of Appendix 2 of GN No. R. 982 of 04 December 2014, this section discusses the need and desirability of the proposed sandwinning process. The format

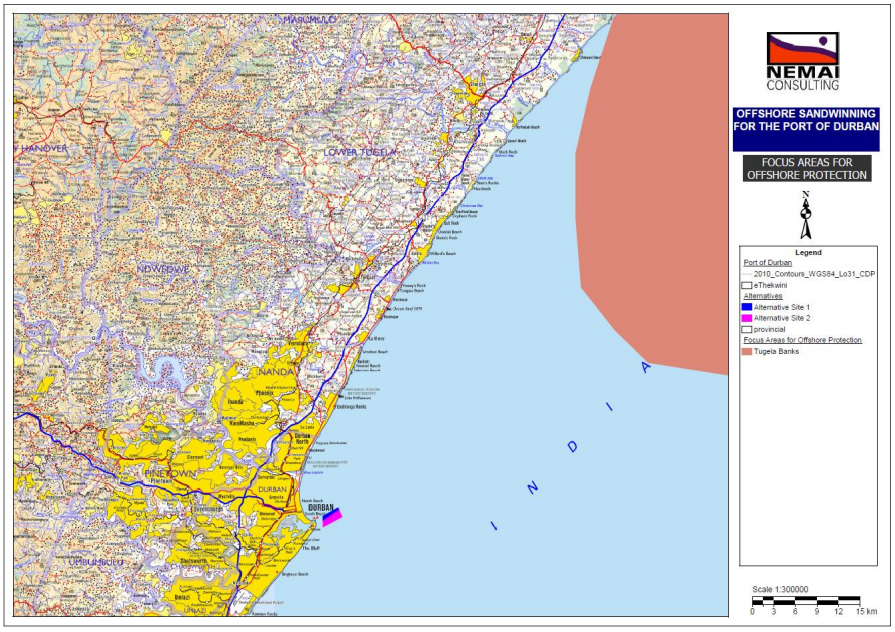
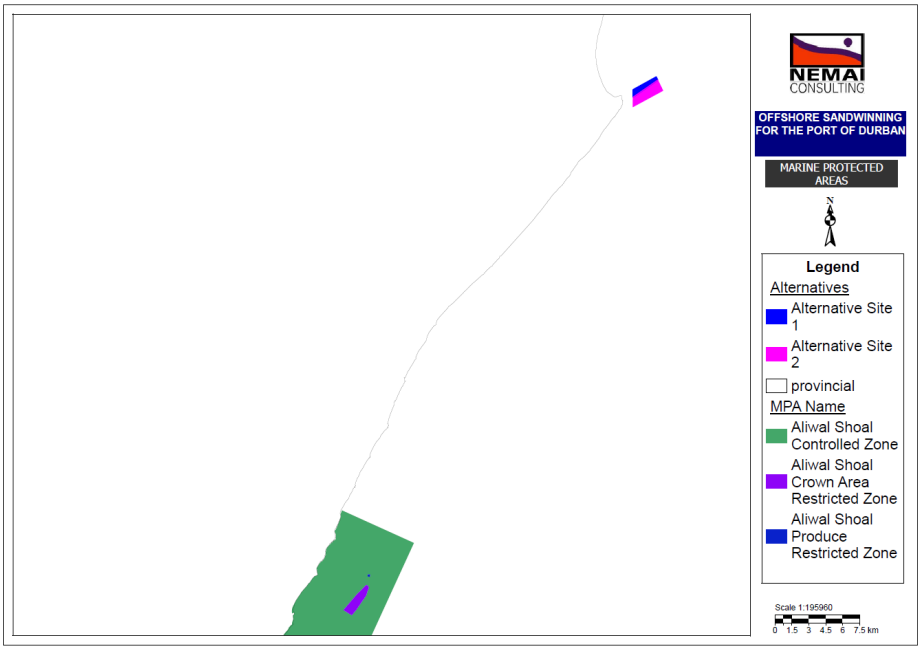
contained in the Guideline on Need and Desirability (DEA&DP, 2009) has been used in **Table 7**.

Table 7: Need and Desirability

No.	Question	Response
	NEED ('timing')	
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP).	The proposed activity does not occur on land. Therefore there is no land use associated. However, the SDF notes the area as a coastal opportunity zone.  Further, the proposed sites do not occur within a MPA or within Marine Focus Area identified by SANBI.
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	Yes, the offshore sandwinning of material is required at this point in order to allow developments within the Port of Durban. Data from the Transnet eThekwini Municipality Port Initiative (TEMPrI) which is a joint planning initiative between Transnet and the eThekwini Municipality, suggests that the upgrades within the Port are necessary in order to meet current and future demand. The TEMPI exercise occurred in the context of rapidly escalating demand for port capacity and related activities, nationally and particularly in Durban: Current projections are that container volumes will be 2,5 times higher in 2020 than in 2006.

No.	Question	Response
		The Durban port handled 1,7m TEU's in 2005, and Transnet projects that it will need to be able to handle some 5,36m TEU's by 2020, and 8m TEU by 2050. Transnet projections are based on moderate national economic growth estimates (3/4% pa), which are already being exceeded. In addition, Van Coller *et al.,* (2007) undertook a Value Chain Analysis of the Durban Maritime Industry. Data showed that the current efficiency of the container terminals is low. Lastly, major shipping companies have indicated to TNPA that they are planning to start using larger Super Post Panamax vessels which currently cannot be accommodated by berths within the Port.
3.	Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate).	As mentioned, the proposed activity does not occur on land. However, the SDF notes the area as a coastal opportunity zone. The sandwinning will allow developments within the Port of Durban. The Port of Durban is identified by SDF as a strategic economic area. TEMPI (joint planning initiative between Transnet and the eThekwini Municipality) undertook to understand the Economic footprint of the Port of Durban. Around 32 000 people are employed directly in the port. In addition, approximately 7000 people are employed indirectly. According to the IDP (2011) employment numbers in the eThekwini Municipality amounted to 53.4% of the provincial total with the majority of employment opportunities in (1) wholesale and retail trade, (2) community services and (3) manufacturing; Ongoing improvements at the Port of Durban have cushioned the blow of the global economic slowdown (IDP, 2011). According to the IDP (2012), major development projects planned for the eThekwini Municipality are poised to have a positive impact on the economy during the next ten to fifteen years. Expansions at the Durban Port, the mixed-use development at Cornubia, the Dig-out Port at the old airport site, the major shopping centre development at Shongweni in the outer west, new developments at Dube Trade Port and a massive tourism boost from the Conference of the Parties (COP) 17 event at Durban ICC during November 2011 are all expected to play an effective role in placing the Municipality on a firm growth trajectory especially for the local economy and job creation. Based on this information, the sandwinning is both a local and national priority.
4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	No new services are required for the proposed activity.

No.	Question	Response
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services)?	As mentioned, the activity occurs offshore in an area identified as a coastal opportunity zone. However the sandwinning will allow developments within the Port of Durban. As the proposed development is part of a Transnet planning initiative it does not fall part of the infrastructure planning of the Municipality. In terms of required infrastructure, there will be no implications on the Municipality. However, Transnet and eThekwini initiated a joint planning initiative in 2006 called TEMPI which aimed to develop a framework to inform independent decision making, based on a shared vision and understanding of future development requirements of the port and the city. There will be no implications on infrastructure planning on the municipality.
6.	Is this project part of a national programme to address an issue of national concern or importance?	The National Development Plan for 2030 makes mention of new plans developed by Transnet to address the capacity issues with the Port of Durban. Based on this offshore sandwinning for developments within the Port of Durban is of national importance.
DESIRABILITY ('placing')		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	The BPEO will be assessed as part of the EIA Phase in line with the findings of the specialist studies.
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities?	No, the activity occurs offshore and in area identified as coastal opportunity zone. However the sandwinning will allow developments within the Port of Durban.
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	Compatibility of project with C-plan and other environmental management and planning tools were considered however these tools are limited to land based projects. Information from the Offshore Marine Protected Area project was taken into account however the proposed project footprint does not form part of any offshore marine protected focus area.

No.	Question	Response
		 Information from the South African National Spatial Biodiversity Assessment: Marine Component was also assessed however the closest of these MPAs (the Aliwal Shoal Controlled Zone, Aliwal Shoal Crown Area Restricted Zone and the Aliwal Shoal Produce Restricted Zone) was approximately 44 km's south west of the proposed site and such the footprint does not fall within any offshore MPA.  Further impacts will be assessed as part of the EIA phase after the completion of the relevant specialist studies.

No.	Question	Response
10.	Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context).	The proposed footprint is within close proximity to the Port and has the required infill material. As such, location factors favour this use.
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	A detailed impact assessment will be included as part of the EIA. No fatal flaw impacts have been identified through the Scoping exercise (see **Section 14** for environmental issues identified).
12.	How will the development impact on people's health and wellbeing (e.g. i.t.o. noise, odours, visual character and sense of place, etc)?	No impact on people's health or well being is envisioned however a Wave Modelling Study will be undertaken as part of the EIA to determine any impacts to the shoreline.
13	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	A detailed impact assessment will be included as part of the EIA. No fatal flaw impacts have been identified through the Scoping exercise (see **Section 14** for environmental issues identified).
14	Will the proposed land use result in unacceptable cumulative impacts?	A detailed impact assessment will be included as part of the EIA. No fatal flaw impacts have been identified through the Scoping exercise (see **Section 14** for environmental issues identified).

12 PROFILE OF THE RECEIVING ENVIRONMENT

12.1 Climate

12.1.1 Overview

The area around the Port of Durban is subjected to a warm maritime climate with average minimum temperatures of 16°C during the winter months of May to July and an average of 27°C during the hotter summer months of January to March (MER/ERM, 2011) (**Table 8**).

Table 8: Minimum and Maximum Monthly temperatures recorded at Durban Airport (MER/ERM, 2011)

	J	F	M	A	M	J	J	A	S	O	N	D	Avg
Durban-Max (°C)	27	27	27	24	23	23	22	22	22	23	25	26	24
Durban-Min (°C)	22	22	22	19	16	16	16	17	17	18	20	21	19

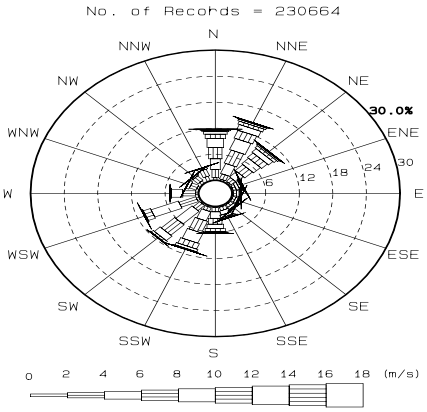
The area is generally wet, receiving an average rainfall of 1054 mm/year. Most of the rainfall is received in summer (MER/ERM, 2011) (**Table 9**).

Table 9: Monthly average rainfall recorded at Durban Airport (MER/ERM, 2011)

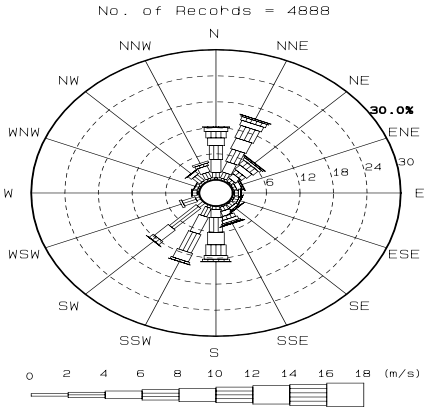
	J	F	M	A	M	J	J	A	S	O	N	D	Avg
Durban-Rainfall (mm)	119	127	132	84	56	33	36	48	74	109	117	119	87

Winds inside the Bay are significantly less than those measured at the Port Control tower and on the eastern breakwater. Within the Bay, the Salisbury Island area is sheltered from SW to SSW winds that predominate in winter. To a lesser extent the same observation can be made for the container terminal. However, winds measured on the northern part of the Bay between the yacht basin and the T-jetty do not show similar sheltering effects with respect to SW to SSW winds. All sites seemingly are fully exposed to the NNE and NE winds that predominate in spring and summer, the strongest NNE/NE winds being observed at Salisbury Island (**Figure 10**) (CSIR, 2011).

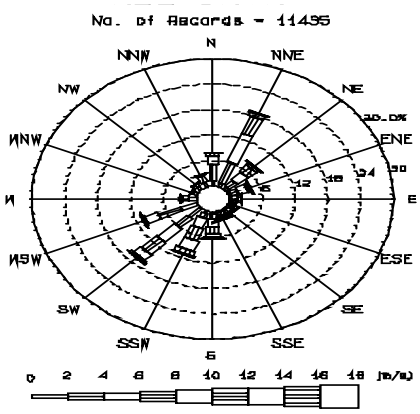
Port Control 2



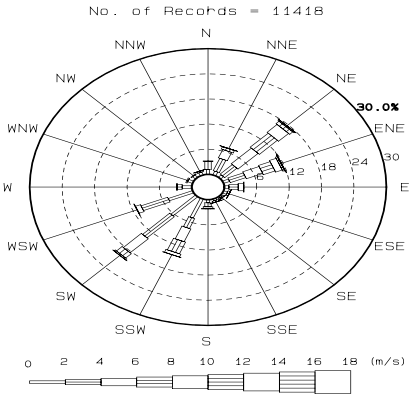
Eastern Breakwater



Durmarine Building



Container Terminal



SA Navy Base

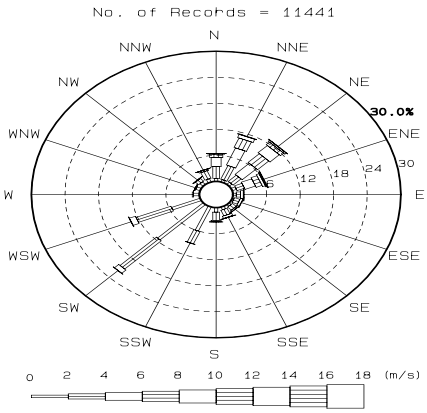


Figure 10: Annual wind roses for various locations in the Port of Durban for the period May 2010 to October 2011

12.1.2 Implications

The proposed activity will not have any impact on climate. Climate Change

12.2 Climate Change

12.2.1 Overview

The information summarised below has been taken from the Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2013) and shows that each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850 with the globally averaged combined land and ocean surface temperature data as calculated by a linear trend, show a warming of 0.85 [0.65 to 1.06] °C, over the period 1880 to 2012 (IPCC, 2013).

Changes in many extreme weather and climate events have also been observed since about 1950 and the frequency of heat waves has increased in large parts of Europe, Asia and Australia. There are also more land regions where the number of heavy precipitation events has increased. The frequency or intensity of heavy precipitation events has likely increased in North America and Europe. (IPCC, 2013).

The AR5 also notes that it is very likely that the number of cold days and nights has decreased and the number of warm days and nights has increased on the global scale.

Ocean warming dominates the increase in energy stored in the climate system and accounts for more than 90% of the energy accumulated between 1971 and 2010. It is *virtually certain* that the upper ocean (0−700 m) warmed from 1971 to 2010. On a global scale, the ocean warming is largest near the surface, and the upper 75 m warmed by 0.11 [0.09 to 0.13] °C per decade over the period 1971 to 2010.

The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia. Over the period 1901 to 2010, global mean sea level rose by 0.19 [0.17 to 0.21] m (IPCC, 2013).

The key climate change and climate change-related factors which can affect offshore sandwinning are listed below:

- Increasing storm surge heights;
- Possible increases in storm intensity;
- Changes in seasonable precipitation amounts; and
- Increasingly intense precipitation events.

12.2.2 Implications

The Offshore Sandwinning Project will not have an impact on climate change. Mitigation measures to minimise emissions related to the dredgers will be included in the Sandwinning EMPr. The effects of climate change such as increased storm events may have an impact on the project. The impacts of these storms on dredging activities at the offshore sandwinning site may result in spillages of dredged material and safety risk to the dredging team. Mitigation measures related to these impacts will be addressed Offshore Sandwinnintg EMPr.

12.3 Maritime Archaeology

12.3.1 Overview

According to the Shipwreck database compiled from Levine (1986) and Turner (1988) (CSIR, 2011), 139 ships have been wrecked in or near Durban Harbour since 1685. Of these, 38 were salvaged or removed, either at the time of the event or years later, as in the case of the *Karin*. Of the 101 remaining wrecks, 12 were scuttled in the deep water either off the Bluff or about 5km away from Durban; 28 were wrecked in or near the entrance to the harbour and the remaining 61 were wrecked on the Durban Beach areas or the Outer Anchorage. **Figure 11** below depicts 4 Shipwreck Zones which occur within an around the Durban Harbour.

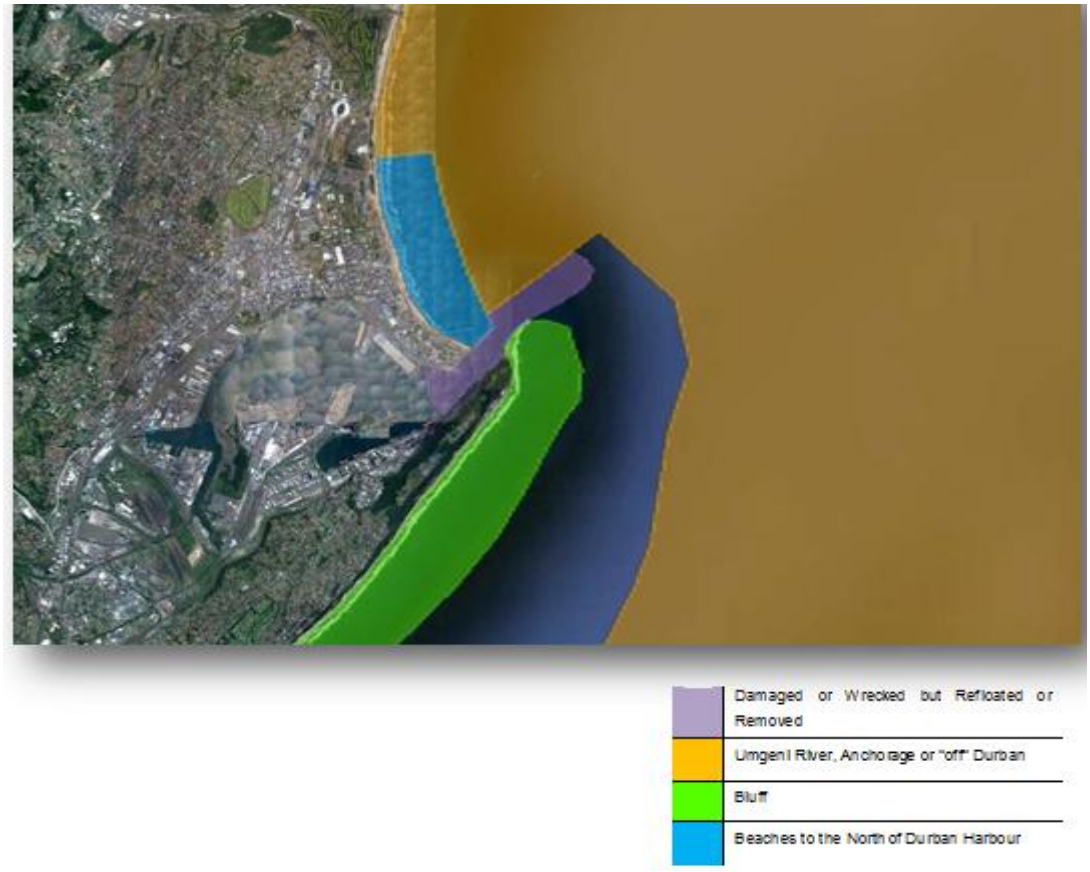


Figure 11: Durban Harbour Showing Shipwreck Database Zones (From CSIR, 2011).

The below wrecks were either reported as wrecking in the harbour or their whereabouts are not recorded in the standard databases.

Table 10: Wrecks near the Durban Harbour (from CSIR, 2011)

Name	Status	Origin	Date	Comment
Burnham	Aground – Wrecked	Britain	29 May 1840	**Harbour?** The vessels cable parted at the port, during a north-west gale and went aground. Part of cargo was saved and no lives were lost.
Elizabeth Anne	Wrecked		October 1863	
Fleur de Maurice	Aground	Britain	April 1894	
Kayle				
M. Smith Peterson	Abandoned – Towed – Converted to hulk	Norway	23 March 1903	**Durban as a hulk.** After the vessel was disabled in a gale, the crew were rescued by the fishing steamer, Hansa and brought to Durban. The barque was abandoned near Port Shepstone and towed to Durban

				by the tug Ingane. She was converted into a hulk.
Northwester / North-Wester	Wrecked?		31 May 1939/1839	No lives lost.

12.3.2 Implications

An Underwater Heritage Impact Assessment was undertaken to determine any impacts to underwater heritage resources.

12.4 Tourism

12.4.1 Overview

The main tourist areas around the site include the Marinas, the beaches and uShaka Marine World.

Durban is considered a popular holiday destination and is reliant on revenue generated by domestic and foreign tourism (Mather et al. 2003). Holiday makers are attracted by the prevailing warm weather and warm sea temperatures, and for this reason the beaches of Durban are considered a valuable ecotourism resource

According to Tourism KwaZulu-Natal (2007), the main recreational activities undertaken along the various beaches and the ocean adjacent to them include:

- Surfing and other forms of wave-riding;
- Jet-skiing;
- Ocean kayaking;
- Kite-surfing;
- Wind-surfing;
- Recreational fishing from fishing boats and breakwaters;
- Snorkelling;
- Swimming;
- Scuba-diving;
- Life-saving;
- Beach soccer and beach volley ball;
- Sun bathing; and
- Jogging and walking.

Overall, tourism is highly dependent on beachs and thus the beaches of Durban are considered a valuable ecotourism resource. Construction of the harbour began in 1857 and later included a large sand trap area just south of the harbour mouth to collect sand moving northward and to prevent the entrance from being blocked up. This interrupted the supply of sand to the northern beaches and as a result, they became severely eroded. In order to

counter the erosion, a sand pumping scheme was implemented in 1935, whereby the sand trap was emptied with a dredger and the sediment pumped to the northern beaches. This proved unsuccessful and erosion continued despite further pumping schemes and the construction of the Paterson Groynes in the mid 1950's. Further studies resulted in the implementation of the current scheme which was commissioned in 1982 to replenish the eroded beaches. This included continuation of the sand pumping scheme together with the replacement of the Paterson Groynes with two low-level groynes built in 1983 and 1985 and a third groyne built in 1987/88 to create acceptable beach profiles. The sand trap does not trap at 100% efficiency, however it is assumed that the pumped volume closely represents the sediment volume entering the sand trap i.e. natural littoral drift. Mather *et al.* (2003) conclude that the scheme achieved its objectives and report a constant supply of sand to Durban's beaches at an average volume of 280 000 m^3 per annum.

Results from a recent study, by Corbella and Stretch (2012), show that beaches within The Durban Bight have been gradually receding over the past 4 decades. This is directly attributed to a decrease in sediment being deposited on the beaches as a result of reduced littoral transport. It is suggested that terrestrial anthropogenic activities such as dam construction and mining of river sand have reduced sediment supply and constitute an important factor in the observed erosion trends. Added to this are the effects of an annual rise in sea level estimated at 2.7mm ± 0.05mm per year at a 95% confidence level (Mather 2007).

12.4.2 Implications

The proposed offshore sandwinning may impact on tourism activities through increased turbidity in the area. In addition, changes to the seabed may result in changes to wave action and resultant changes sedimentation/erosion of beaches. A Wave Modelling Study will be undertaken as part of the EIA Phase to determine these impacts. In addition, the Marine Impact Assessment will assess impacts related to turbidity.

12.5 Geology

12.5.1 Overview

The Council of Geosciences noted that the area in question has weak to moderately reflective, even toned planar acoustic facies which is typical of fine to medium grained unconsolidated shelf sand (i.e. normal near shore marine sediments). The sediments in the north (i.e. Alternative Site 1) are courser grained. The areas scattered reef outcrop within both areas are sparse and form an outcrop pattern. Grab samples in the area were characterised by light olive to light reddish brown moderately well sorted to very well sorted, subangular to well rounded, medium grained, clean free flowing sands with high calcium

carbonate contents, low gravel contents and low interstitial mud. **Figure 12** provides an overview of the geology.

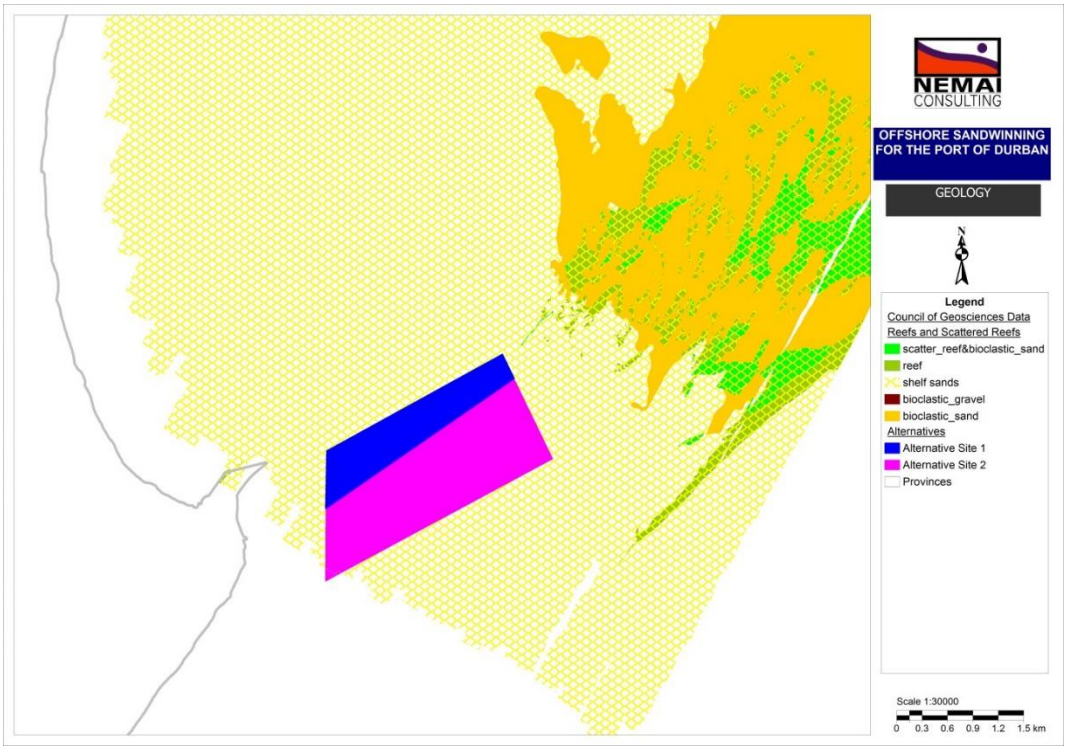


Figure 12: Geology

12.5.2 Implications

The geological conditions have implications on the potential turbidity of the sandwinning operations, with courser sediments decreasing the amount of fine suspended sediment. This will be taken into account in the Marine Impact Assessment. In addition, the geology of the two sites will be taken into account from a technical perspective in terms of which area is preferable for sandwinning operations.

12.6 Bathymetry

The bathymetry of Alternative Site 1 varies from a minimum of -19m to a maximum depth of –20m (Council of Geosciences, 2001). The area is dominated by a northern mound which measures 2000m in length, 750m in width and 10m in height. In general, the bathymetry is gently undulating with bathymetric gradients varying from 0.14° to 0.69° (Council of Geosciences, 2001). In contrast, the bathymetry of Alternative Site 2 varies from approximately –20m to a maximum of –32m (Council of Geosciences, 2001). The site also

has a mound which is approximately 1500m in length, 700m in width and only 2-3m in height.

Figure 13 provides an overview of the bathymetry of the site.

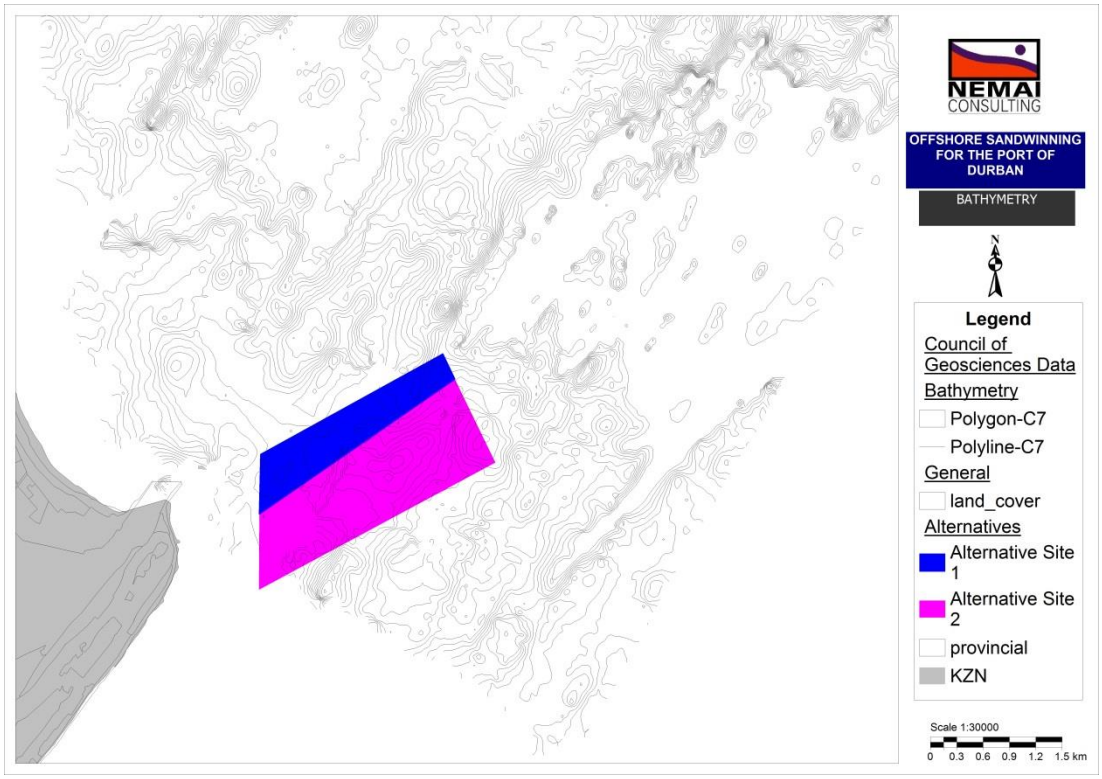


Figure 13: Bathymetry

12.6.1 Implications

Offshore sandwinning at either alternative site will change the bathymetry of the ocean floor. In order to obtain the required volume of material from either alternative, sandwinning will proceed to approximately – 4 m below the current level in Alternative Site 1 and approximately -2 m below the current level in Alternative Site 2. The impact on wave action was assessed through a Wave Modelling Study.

12.7 Ocean Currents

12.7.1 Overview

The most important large-scale oceanographic feature in the vicinity of the proposed sand winning sites is the Agulhas Current. This current originates off the northern Natal/Mozambique coast and sweeps polewards with the core of the current located just

offshore of the shelf break. The influence of the current on processes on the shelf varies along the coast largely due to changes in bottom topography (Schumann 1998).

Four distinct coastal regimes have been identified along the Natal coast, with the proposed sand winning sites located in the region referred to as “the Durban Shelf”. This region extends from just north of Durban Bay southwards as far as Mzinto. Schumann (1998) refers to it as a transition region between the wind dominated shelf to the north and the Agulhas current dominated region to the south. A trend is evident in the water movements in this region with distance offshore, the water movement being predominantly northeastwards close to the coast (where the sand winning sites are located) changing gradually to a southwestward flow at about 50 km offshore. There are however, also fairly regular current reversals in the inshore region (i.e. to southwestward flow).

12.7.2 Implications

The proposed offshore sandwinning should not impact on ocean currents. However a Wave Modelling Study will be undertaken as part of the EIA Phase.

12.8 Marine Sensitivity

12.8.1 Overview

According to the KZN Marine Systematic Conservation Plan (2012), the proposed sites do not fall within any Critical Biodiversity Area (CBA) (**Figure 14**).

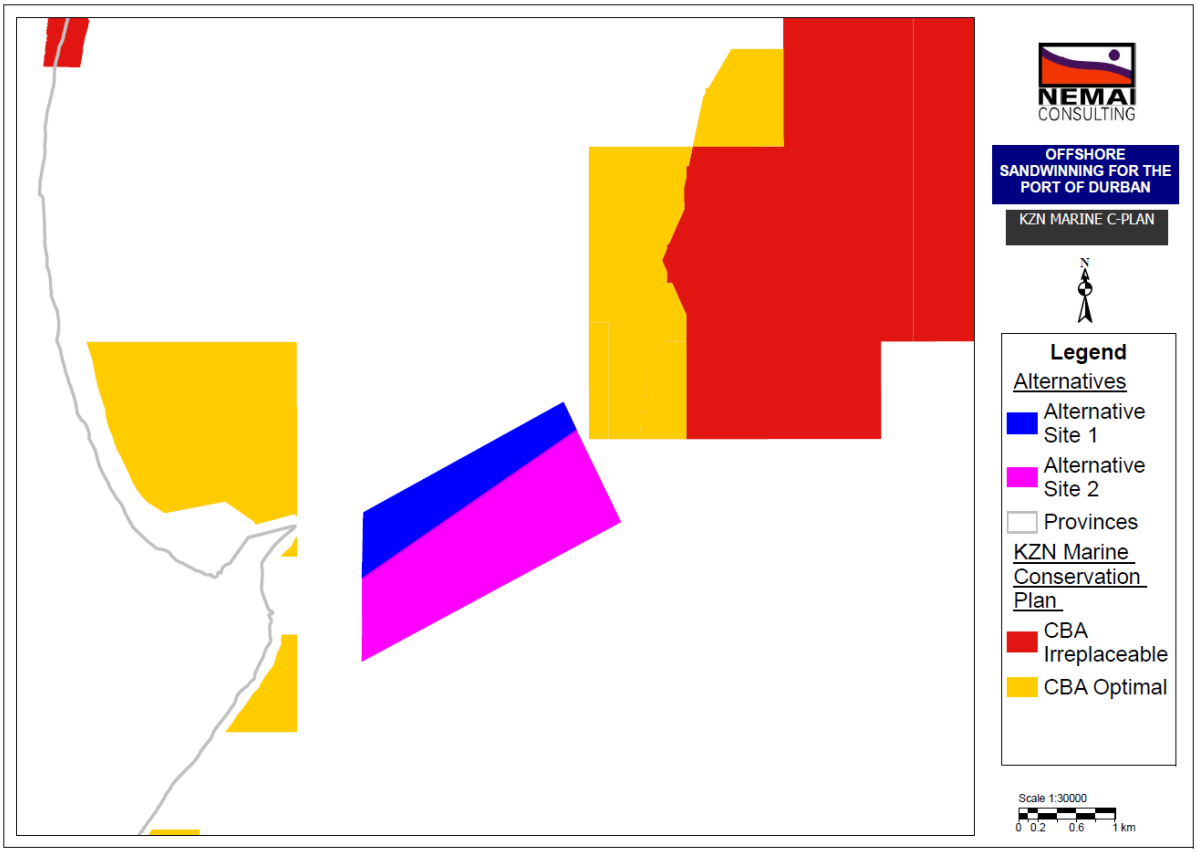


Figure 14: KZN Marine Systematic Conservation Plan

The National Spatial Biodiversity Assessment (NSBA) (2004) was also assessed. This report presents a spatial assessment of the conservation status of selected marine biodiversity patterns in South Africa, at a national scale. It addresses a subset of marine species, and broad scale intertidal and subtidal habitats (within South African waters, to the Exclusive Economic Zone - EEZ). The report is useful for improving biodiversity management in the marine environment.

According to the NBSA, the area in question falls into a zone which is moderately protected (**Figure 15**). Furthermore, it falls within the unconsolidated inshore habitat and does not extend into any inshore reef habitat **(Figure 16**).

The report also noted a number of MPAs however the closest of these (the Aliwal Shoal Controlled Zone, Aliwal Shoal Crown Area Restricted Zone and the Aliwal Shoal Produce Restricted Zone) are approximately 44 km's south west of the proposed (**Figure 17**).

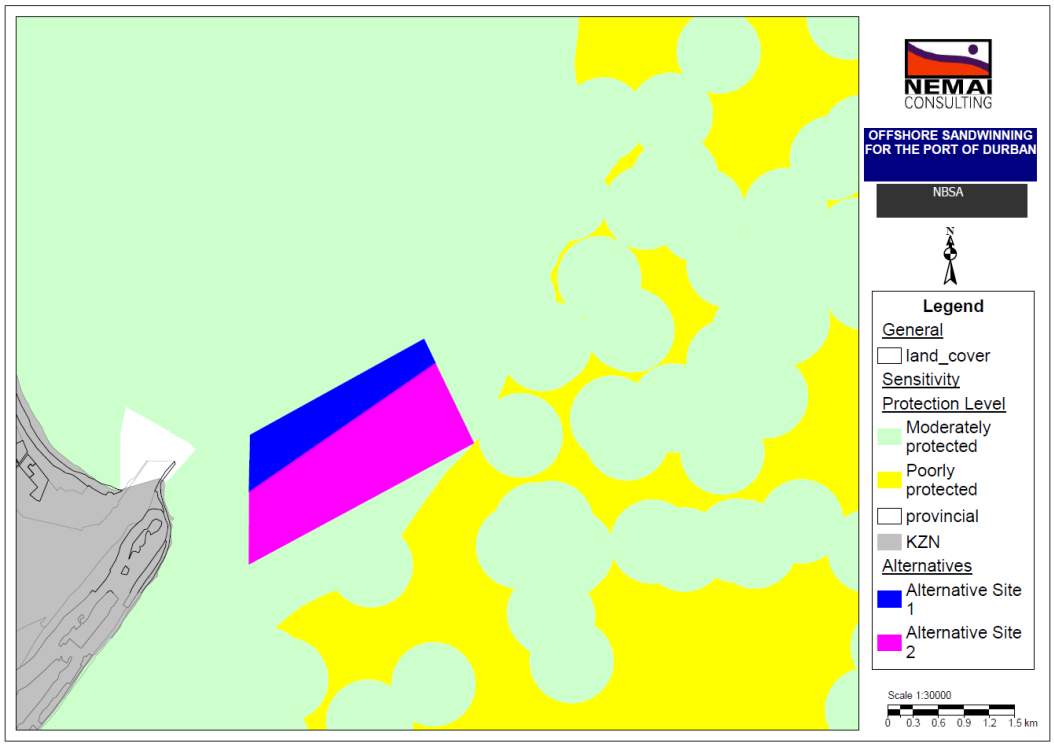


Figure 15: NBSA Protection Level

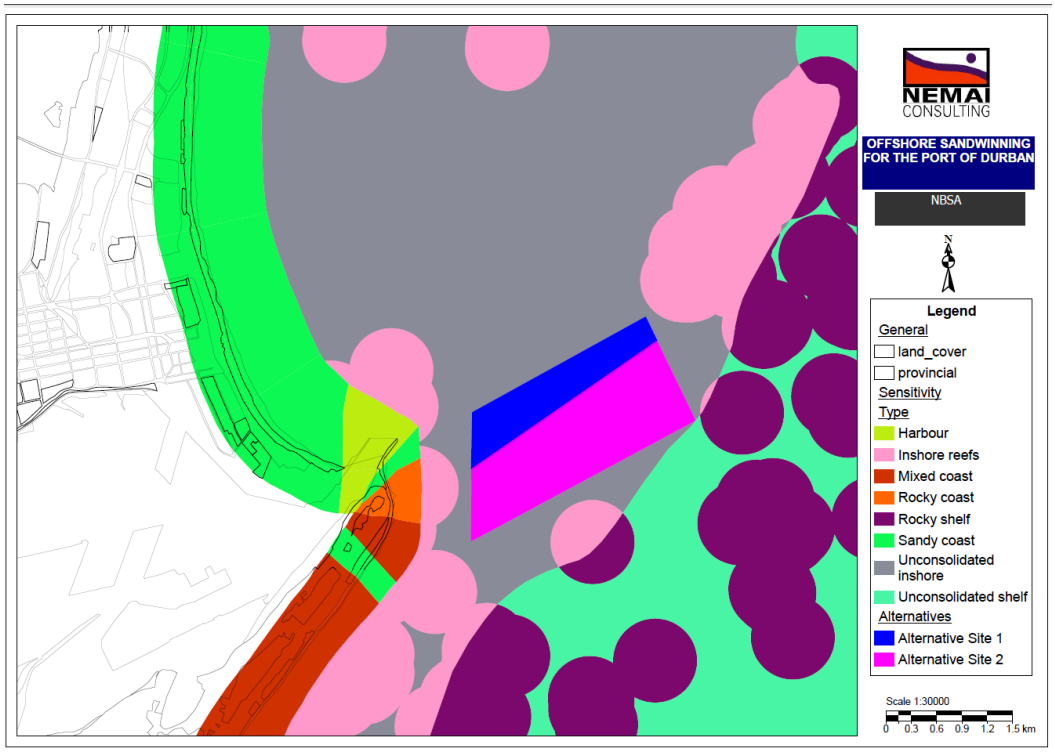


Figure 16: NBSA Type

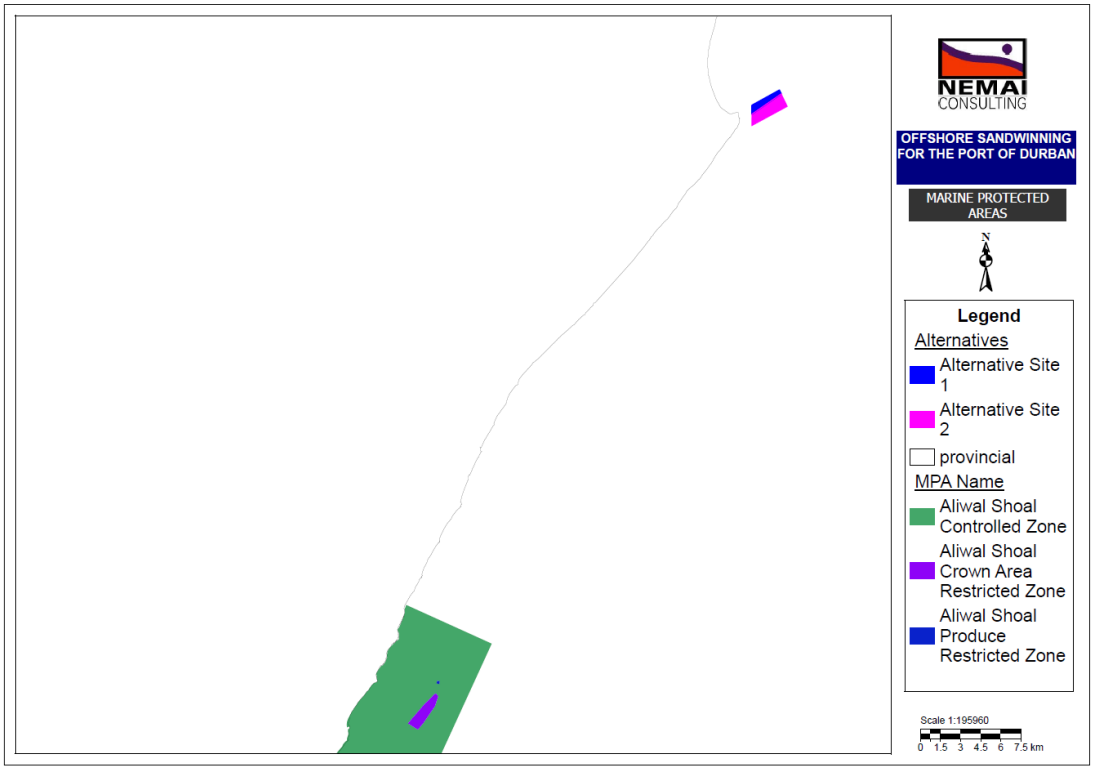


Figure 17: Focus areas for offshore protection

In terms of MPAs, most offshore habitat types are unprotected. The offshore expansion of South Africa's MPA network is a national priority. A collaborative five-year Offshore Marine Protected Area project was undertaken to support the identification of a network of potential offshore spatial management measures including MPAs. The network aims to represent offshore biodiversity, protect vulnerable marine ecosystems, contribute to fisheries sustainability, support the management of bycatch, and provide for research and monitoring. The study found that the closest focus area to the study site was the Tugela Banks area which is approximately 45 km north east of the proposed offshore sandwinning sites.

The area was identified as a zoned Marine Protected Area and industry –specific fisheries or bycatch management areas should be considered for implementation in this area. Unprotected pelagic and seabed habitats (such as Natal shelf muds and gravels and submarine canyons) warrant protection in this area which has complex sedimentary patterns and complex oceanography. This area is highly productive and serves a nursery area for many species. This focus area was also identified by finescale planning conducted in KwaZulu-Natal through the SeaPlan project led by Ezemvelo KZN Wildlife (**Figure 18**).

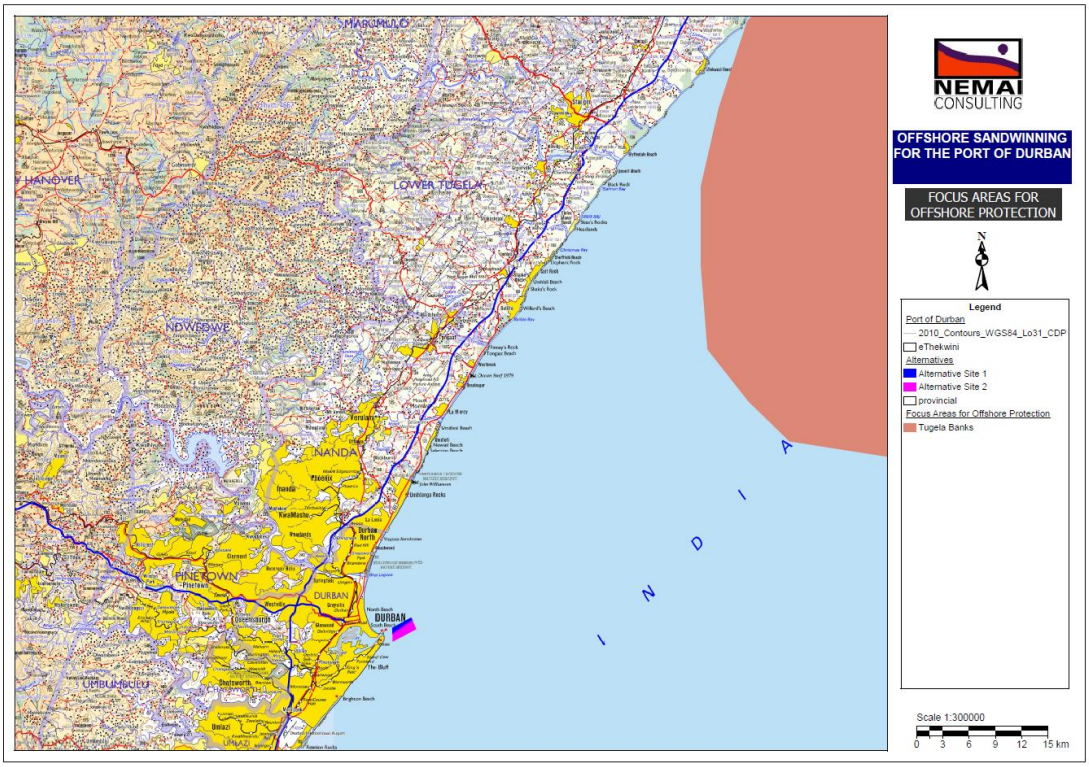


Figure 18: Focus areas for offshore protection

12.8.2 Implications

In terms of the Marine C-Plan and NBSA, the proposed activity will not take place in a CBA area or MPA and therefore will not have any impacts on these sensitive areas. However a Marine Impact Assessment will be undertaken as part of the EIA Phase.

12.9 Avifauna

12.9.1 Overview

Avifauna on Durban beachfront is relatively depauperate as one would expect with a course-grained sandy beach habitat. Disturbance levels are high as this is a popular area for recreational users. Most of the avifaunal community is comprised of gulls, particularly the Grey-headed Gull and Kelp Gull (SABAP 2, 2012). Cape Wagtail, White-fronted Plover and Pied Kingfisher are also regularly seen. During the summer months the occasional Palaearctic migrant may be seen, like the Common Greenshank, although most of these and other waders prefer the Durban Bay harbour intertidal flats. Swift Tern, Common Tern and Caspian Tern are also present but rarely land on the beaches.

12.9.2 Implications

Impacts to avifauna are not expected as the specific offshore area is not a specific avifaunal habitat. However impacts were assessed as part of the Marine Impact Assessment.

12.10 Turbidity

12.10.1 Overview

Water quality characteristics in the inshore waters off Durban Bay are strongly influenced by the prevailing currents, with higher temperature associated with flow from the northeast (up to 22°C), while current switches to the southwest are generally accompanied by a drop in temperature of around 5°C. Nutrient concentrations in the shelf water off Durban water are reported to be low (Nitrates: = 3.33 µM/l, silicates = 3.71 µM/l and phosphates = 0.62 µM/l, Carter & d'Aubrey 1998).

Little data is available on background turbidity in the vicinity of the study area. Previoous studies have quantified this using remote sensing satellite imagery for the surrounding ocean within 3 km of the dredge disposal site. A total of eleven 1-km resolution pixel values of the diffuse attenuation coefficient at 490 nm were extracted from a 3-year time composite AquaMODIS image and the average of these calculated (Porter, 2009). The average diffuse attenuation value (m-1) was then converted to turbidity in nephelometric units (NTU) using the following equation (SKM, 2011):

- Turbidity (NTU) = Turbidity (m-1)/0.0123 (R2 = 0.8065)

Turbidity in NTU was then converted to turbidity (suspended solids) in mg.l-1 , so that the same units were used as those in the turbidity plume modelling. The following equation was used (SKM, 2011):

- Turbidity (mg.l-1) = Turbidity (NTU) x 0.8405 (R2 = 0.9448)

Background turbidity at the sand winning sites was established at 10.4 NTU or 8.7 mg/l for the period in question.

12.10.2 Implications

One of the potential impacts associated with the proposed activity is the increase in turbidity in the area around the site. The Marine Impact Assessment has assessed impacts related to turbidity.

12.11 Marine Biota

12.11.1 Overview

12.11.1.1 Phytoplankton and Zooplankton

Carter & Schleyer (1998) provide a summary of available information on phytoplankton communities of the KwaZulu-Natal shelf region. Chlorophyll-a concentrations in this region are reportedly low (at least an order or magnitude lower than those in the southern Benguela off the west coast of South Africa), and show little variability. Carter & Schleyer (1998) indicate that measured concentrations of chlorophyll-a in this region range from around 0.03 to 3.88 µg/l. Concentrations are highest at around 10 m depth but do not show strong variation with depth. Chlorophyll-a concentrations are higher in inshore water relative to offshore waters, being on the upper end of the range reported above rather than the lower end. Seasonal variations in phytoplankton production have been reported, with production peaking in spring (Schleyer 1981).

Zooplankton biomass in the inshore waters of Natal is reported to be highly variable but can attain moderate to high concentrations, especially close inshore (Carter & Schleyer 1998). Average zooplankton biomass for the region is reported as 0.285 ml/m3 (= 45.6 mg/DW/m^3, Raymont 1983).

12.11.1.2 Intertidal (sandy beach) benthic invertebrates

Invertebrate macrofauna from four beaches in beaches in KwaZulu Natal have been studied and described by (Dye *et al*. 1981). None of these sites were located close to Durban Bay, the closest sites being Kelso beach approximately 25 km south of Durban and Blythedale beach at least 50 km to the north. At the time of sampling these beaches were relatively undisturbed and probably support a much higher abundance and diversity of fauna than those in Durban Bay which are affected by a range of impacts including coastal development, port development, beach nourishment, impaired water quality and high levels of human traffic. That said, Dye *et al*. (1981) list a total of 5 and 9 species of macroinvertebrates (organisms larger than 1 mm) on the two beaches on the northern KZN coast (Sodwana Bay and St Lucia respectively), and only one species (the ghost crab *Ocypode ryderi*) from the beaches close to Durban (Kelso and Blythedale). They attribute the low diversity of macrofauna on the latter two beaches to the very coarse nature of the sediments on these two beaches (median particle: 864 and 992 µm respectively). Dye *et al*. (1981) also surveyed meiofauna (organisms smaller than 1mm) on these beaches and reported large meiofaunal assemblages at the two sites close to Durban, reaching densities up to 2.0-3.74 x 106 ind./m2, at Blythedale and Kelso, respectively. Abundance values at these site were greater than those reported for St Lucia (max = 0.95 x 106 ind./m2) or Sodwana Bay (1.08 x 106 ind./m2).

12.11.1.3 Soft bottom benthic macrofauna

Surveys of benthic invertebrates living in sediments off the KwaZulu-Natal coast date back to the 1900s when the Government of the Cape appointed Dr J.D. Gilchrist to take charge of fisheries and marine biological surveys of the region. These early survey provide some useful insights into the characteristics of the fauna of the region but far more comprehensive surveys have been undertaken more recently in an effort to assess the impacts of wastewater discharges on the marine environment off Durban. These more recent surveys have yielded over 372 identifiable taxa (species) for the region. The nearshore sandy benthos is diverse with a total of 198 invertebrate macrofauna species known to the area (CSIR in 1995). Moderate diversity at the site from which the data was collected (and the proposed sand winning sites) is to be expected as abundance and diversity seem to peak some distance offshore of the proposed dredge sites (in around 60 m water depth) and declines offshore and inshore of this point (McClurg 1998). Furthermore, it is well documented that benthic invertebrate diversity is greatest along the east coast of South Africa as opposed to the south or west coast (Sink *et al*. 2011).

In terms of community composition, 45% of the 198 species listed consist of Polychaeta, 19% Amphipoda, 7% bivalvia and 5% Brachyura with following taxa constituting the remainder: Actinaria; Anomura; Caridea; Cumacea; Echinoidea; Gastropoda; Holothuroidea; Isopoda; Mysida; Nemertea; Ophiuroidea; Ostracoda; Penaeidea; Sipunculida and Tanaidacea. Meiofauna are reportedly dominated by Nematode worms, followed by annelids (turbellarians) and arthropods (harpacticoid copepods).

12.11.1.4 Fish

The fish fauna of the KwaZulu Natal coast is largely a subset of the Indo Pacific fauna (~74 %), with a number of circumglobal species (~8 %) (Van der Elst 1988). A significant portion of endemics are also found off the KZN coast (~16 %), but they are mostly extensions of species that inhabit cooler temperate regions off South Africa's east coast. Van der Elst (1988) provides an estimate of 1 192 species belonging to 150 families. A large number of these species are tropical reef associated (although the soft sediment habitats may well be essential for certain life history stages), whilst many others will occur in the pelagic realm, or in deeper shelf waters. Of greatest interest in this impact assessment are fish species associated with near-shore soft sediment (sand) habitats off Durban Port and beach front, at approximately 20 m depth.

Data on ichthyofauna from this habitat type offshore of Durban is unfortunately scarce. Fennessey (1994a 1994b) recorded 108 teleost (bony fish) species and 26 elasmobranch species as bycatch in Prawn trawlers operating in similar depths (20-40 m) off the Tugela banks (~100km north of Durban Bay). Although many of these species are likely to occur on the soft sediment habitats off Durban, the community composition (occurrence and relative abundance of species) is likely to be very different. The prawn trawl ground of the Tugela

banks are dominated by fluvial mud sediments and the water is turbid, quite different to the sandy sediments and often clear waters of Durban Bay.

Beckley and Fennessey (1996) report on catches made by the beach seine fishery off Durban. These data, although representative of sandy bottom fish fauna closer inshore (up to 300 m from the beach and 6 m water depth) provide the most likely description of the fish fauna likely to occur on the proposed sand winning sites. A total of 119 fish species, as well as cuttlefish, squid and crabs were recorded in catches. Numerically dominant in catches were small shoaling Clupeids (e.g. sardines), Engraulids (e.g. anchovy) and species of Leiognathidae that typically feed in the water column. Approximately a third of the species recorded in catches, however, are benthic associated and most likely to be impacted by dredging operations. These include several commercially important species of Sciaenids (croakers and drums) and Haemulids (grunts) and a number of elasmobranch species. Soft sediment habitats are the primary habitat for many of these fish as well as being important feeding grounds for these and many other species that may move off nearby rocky reefs to feed on sandy habitat invertebrates. Fennessey (2000) also reported that the turbid, shallow continental shelf waters function as nursery areas for at least four sciaenid species, *Otolithes ruber, Atrobucca nibe, Johnius dussumieri* and *J. amblycephalus,* with juveniles found inshore of adults. Benthic macrofauna including ploychaetes, decapod crustacean, copepods and mysids comprise the dominant food items in the stomachs of these four sciaenids (Fennessey 2000).

Most bottom-dwelling fish in soft bottom habitats are predators. Rays and skates scoop up clams, crabs and other infauna and epifauna, while flat fishes, such as flounders and soles, lie camouflaged or covered on the bottom and forage for a wide variety of prey.

12.11.2 Implications

The most severe impact on the benthic invertebrate macrofauna from dredging at the proposed sand winning sites is physical disturbance of the substratum, resulting in habitat loss and mortality of resident infanua.

Most fish fauna associated with the sandy habitats off Durban are expected to be displaced from areas whilst active dredging is taking place. Larger fish and elasmobranchs that are mobile enough will probably will swim away from the area of active dredging and will be not be susceptible to entrainment in the dredging equipment. The anticipated impacts of active dredging for larger mobile fish therefore amounts to disturbance rather than fatalities. Smaller cryptic species that shelter on or actually burrow in the sediment, and have more limited mobility such as the small sole, tonguefish, lizzardfish and flounder species, may get sucked up by the dredger and experience mortalities.

Indirect impacts related to turbidity were assessed in the Marine Impact Assessment.

12.12 Socio-Economic Environment

12.12.1 Overview

As the proposed development is related to an offshore environment it is difficult to provide an overview of the socio-economic environment. However, as the proposed activity is required for development with the Port of Durban, an overview of the Port is provided below:

The main container port on the South African coast is the Port of Durban. Approximately 65% of South Africa's container traffic is handled by the port, serving KwaZulu-Natal, the Gauteng region as well as a large portion of the South African hinterland. It is also one of the busiest ports in Africa.

Although Durban is a mature port with increasingly congested operations, there is potential to improve throughput capacity by reconfiguring and rationalising the existing precincts of the DCT, Point, Maydon Wharf and Island View. The under-utilised Bayhead rail precinct is ideally suited for back-of-port commercial logistics development in the medium-term to long-term scenarios.

Major expansion projects are planned for the Port of Durban, which include the deepening of the north quay at DCT and the infilling at Pier 1 of DCT. Other projects include the berth reconstruction and deepening at Island View and Maydon Wharf (MW), and the development of a new dedicated passenger terminal at the Point. In addition, the development of the Durban Dig-Out Port (DDOP) at the old airport site is vital to providing capacity in the medium- and long-term scenarios for the areas and region mentioned above.

South African Economic Trends

A study by Urban-Econ (2014) indicates that the export and import trends in South Africa for a ten year period (from 2003 to 2013) have grown by an average of 15.3% and 14.4% respectively. There has been a recovery of the income and export growth post the 2008-2011 Global Economic Recessions. Although growth in manufacturing exports has tapered out after the Global Economic Recession, manufacturing still contributes primarily to both the total imported and exported goods in South Africa.

Growth in production measured using GVA (gross value added) has grown more slowly over this period, with an average of 3.73% year on year in this time. Trade and production rely on each other. The majority of this trade is done through the Port of Durban and therefore, as production increases, so will demand for the port.

Economic Trends in the Port of Durban

Imports and Exports have remained relatively stable over the period between April 2012 and September 2014, with an average growth rate of 1.3% and 1.8% respectively. Container trade in Durban is driven by deep sea imports with only 12% of the container volume (in

2013/14) contributed by trans-shipment volumes. Imports are expected to continue driving container trade in South Africa until South African manufacturing industries grow and the demand for mineral exports improves.

For Durban, the key trade partners are the Far East (contributing ~50% of container trade by weight) followed by Europe and North America. Raw materials, manufacturing & machinery, food, base metals and agriculture drive the container trade industry in South Africa. The vast majority of the container imports are for the domestic market with a small percentage of total demand being transported to neighbouring countries by land.

TNPA has also prepared the Port of Durban Development Framework in which forecasts indicate continued strong growth in container volumes through the Port (and in line with world trends). The objectives of this framework are:

- To provide additional container handling capacity to meet future demand; and
- To consolidate general cargo handling facilities and the alignment of operations with best practices.

The Port of Durban together with its associated catchments forms the core of urbanisation and industrialisation. As such, a large portion of the 3 583 300 people living in Durban (Statistics SA, 2007), together with associated activities supported by the port, all may ultimately impact on the functioning of the Bay (MER/ERM, 2011). In fact a large portion of Durban's population lives within the catchments in which the Bay is located (approximately 13% of Durban's total population i.e. 465 829 people), with an additional 10% of the total population (i.e. 360 791 people) occurring within 6 kilometres of the Bay (MER/ERM, 2011).

MER/ERM (2011) identifies a range of land use and social users within and on the border of the primary boundary (i.e. the Bay), including:

Predominant industrial activities surrounding the port include:

- Port activities in various operational terminals; and
- Industrial activities undertaken by tenants including petro-chemical storage, cold storage, manufacturing industries and liquid bulk.

A small portion of the bay is used for non-industrial purposes including:

- Recreational users such as marinas and club houses;
- Commercial users such as the Bat Centre and Wilson's Wharf complex; and
- Natural heritage areas such as the mangrove area near King's Rest.

MER/ERM (2011) further identifies a range of social users and activities within the secondary land use boundary (i.e. the immediate vicinity of the Bay and beyond) including:

- Large scale back of port industry;

- CBD and associated commercial retail and state institutions;
- Tourism and recreational facilities;
- Open space classified areas on the Bluff, Durban Botanical Gardens and Albert Park;
- Formal and less formal settlements in the areas of Clairwood, Bluff and Glenwood;
- Undeveloped land near the Bayhead rail yards;
- Rail facilities and shunting yards in the Bayhead area; and
- Recreational areas including Sun Coast Casino and Durban Central Beachfront.

12.12.2 Signficance

The need for offshore sandwinning is related to the socio-economic environment of the Port of Durban and the national economy. No negative socio-economic impacts related to offshore sand winning are anticipated.

13 PUBLIC PARTICIPATION

13.1 Landowner Notification

The proposed activity occurs off the east coast of South Africa (approximately 1.2km east of Port of Durban) as such there is no landowner, occupiers or tribal authorities etc. to be notified. In addition, there are no powerlines, public roads or railway lines within 100m of the site. The location of services such as cables will be determined during the Scoping and EIA process and should they occur within 100m of the site, responsible authorities will be notified.

13.2 Initial Public Participation

Nemai Consulting commenced with initial public notification in July 2016 in which the key regulatory authorities, stakeholders and the public were informed of the proposed activity.

13.2.1 Identification of IAPs and Compilation of IAP Database

IAPs were identified based on regulatory requirements and the specific site/project requirements. However, in summary, the database includes the following:

- Key Organs of State/Authorities – the Organs of State that will be given the opportunity to provide comment on the Scoping and EIA reports, including:
  - DEA Impact Assessment;
  - DEA: Oceans and Coasts;
  - KZN EDTEA;

- EKZNW;
- DWS KZN Regional Office;
- DMR KZN Office;
- Amafa aKwaZulu-Natali;
- DAFF; and
- eThekwini Metropolitan Municipality.

- Other Organs of State that may bear interest in the project.
- Stakeholders and the affected service providers affected by the development.
- Conservancies and recreation organisations near the site.
- Farms, estates and rate payer's associations in the surrounding area.
- Businesses in the surrounding area.
- Any other organisations or people that may be interested in this development.

In addition to the above members of both the Berth 203 to 205 Expansion EIA and Durban Bay Estuary Management Plan IAPs' database were included in the initial notification.

A copy of the IAP database to date is available in **Appendix 5**.

13.2.2 Initial Registration Notification Process

13.2.2.1 Background Information Document (BID)

BIDs (**Appendix 6**), which included a Reply Form, were distributed by email or hand delivered to IAPs contained in the IAP Database. BIDs contained a brief background and description of the project, as well as the EIA process, and listed the details for submitting comments regarding the proposed development. The BID served to notify IAPs of the project and the details on how to register as an IAP. The initial registration period took place from **13 July 2016 to 15 August 2016.** Proof of emails and SMSEs sent out to IAPs is provided in **Appendix 9.**

13.2.2.2 Site Notices

Onsite notices were placed around the Port of Durban and the coastal areas closest to the proposed sites. These notices provided information on the project and explained how to register as an IAP. The coordinates of the locations where the site notices were placed are included in **Table 11**.

Table 11: Locations of Site Notices

Point	Coordinates
1 - Ocean Terminal Building	29°52'6.76"S; 31° 2'4.70"E
2 – Queens Warehouse	29°52'9.97"S; 31° 2'32.40"E
3 – Ushaka Marine World	29°52'7.75"S; 31° 2'41.17"E
4 - Durban Maritime Museum	29°51'43.18"S; 31° 1'43.88"E
5 – Marina	29°51'43.97"S; 31° 1'19.20"E
6 – Promenade	29°51'29.75"S; 31° 2'25.87"E
7 – Sandile Thusi/Snell parade	29°50'22.01"S; 31° 2'8.04"E
8 - Bayhead Road	29°54'17.60"S; 31° 0'34.41"E
9 – Foreshore Drive	29°55'24.03"S; 31° 1'9.52"E
10 – Marine Drive	29°53'53.58"S; 31° 2'16.77"E

Proof of site notices are provided in **Appendix 7**. Notification of the proposed development and how to register as an IAP were provided on the site notice.

13.2.2.3 Newspaper Notice

One notice was placed in the Isolezwe Newspaper on the 13 July 2016. These notices provided information on the proposed development and details on how to register as an IAP. A copy of the newspaper notice is provided in **Appendix 8**.

13.2.2.4 Update of IAP Database

Opportunity was provided until 15 August 2016 to register as an IAP. The IAP Database was updated based on comments and/or registration forms received. All comments received are included in **Appendix 10.**

13.3 Public Participation – Scoping Phase

Public Participation during the Scoping phase serves to identify and prioritise issues for further assessment during the EIA phase. This report documents all correspondence to date (mostly received during the registration period) and will be available for the public and authorities to review and provide further comments on during the 30-Day Draft Scoping Report review period.

The comments received from IAPs during the Draft Scoping Report review period (as well as the minutes of the Public Meeting) will be considered and will be investigated further to be included in the Final Scoping Report. The public and authorities will be provided with the Final Scoping Report (which will include the updated Comments and Responses Report) to review at the same time the Final Scoping Report is submitted to the Competent Authority (DMR). The EAP will forward all comments received by registered IAPs on the Final Scoping Report to the relevant DMR Official to take into consideration when making the decision to approve or reject the Final Scoping Report.

Notices were places in the Isolezwe and The Mercury Newspapers to notify all IAPs of the review of the Draft Scoping Report. Site notices were also placed at the same locations listed in **Table 11**.

13.3.1 Public Review

In accordance with G.N. No. R. 982 of 04 December 2014, IAPs are granted an opportunity to review and comment on the DSR. Hard copies of the document were placed at the Central Reference Library (10th Floor, Liberty Towers, 214 Dr Pixley KaSeme Street, Durban, 031 322 4414). Emails and SMSes were sent to all registered IAPs which included the details of the review period of the DSR and the public meeting. Proof of the notification of the public review period will be included in the Final Scoping Report.

The public review of the DSR will occur for a 30-Day review period from **22 September – 24 October 2016**.

13.3.2 Authority Review

Hard/Electronic copies of the document were also provided to the following key regulatory and commenting authorities:

- DEA: Impact Assessment;
- DEA: Oceans and Coasts;
- KZN EDTEA;
- EKZNW;
- DWS KZN Regional Office;
- DMR KZN Office;
- DAFF; and
- eThekwini Metropolitan Municipality.

The DSR was also uploaded to the South African Heritage Resources Information System to allow for review by the South African Heritage Resources Agency (SAHRA). The authority review of the DSR will take place at the same time as the public review period.

13.3.3 Meetings

13.3.3.1 Public Meeting

The details of the public meeting to present the DSR and to provide IAPs with a platform for project related discussions are as follows:

- **Date:** 5 October 2016;
- **Time:** 16h30 to 18h30; and
- **Venue:** Royal Natal Yacht Club, Yacht Mole, Durban Harbour.

The minutes and attendance register of the meeting will be provided in the Final Scoping Report. All registered IAPs were notified of the public meeting via email or SMS. Proof of notification of the public meeting will be included in the Final Scoping Report.

13.3.4 Comments and Responses

The Comments and Responses Report summarises the correspondence received by IAPs and Organs of State completed via the Reply Forms, Comments Sheets, letters, faxes and emails. Refer to **Appendix 11**. This report captures all the significant issues and queries raised, any statements that were made, and a record of all IAPs that registered. This report also attempts to address every comment through responses and input provided by the project team.

13.4 Public Participation – EIA Phase

The Comments and Responses Report is continuously updated throughout the process and thus registered IAPs will have a chance to review this Comments and Responses Report during the 30-Day public and authority review period of the Draft EIA Report. Again, the public and authorities will be provided with the Final EIA Report in which further comments received by registered IAPs (as well as the minutes of the Public Meeting) will be forwarded to the relevant DMR Official to consider when making the decision whether to grant Environmental Authorisation (EA) or not.

14 Environmental Issues

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, this section aims to identify potentially significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA Phase, where the analysis is largely limited to significant issues and reasonable alternatives.

14.1 Approach

14.1.1 Predicting Significant Environmental Issues

The potential environmental issues associated with the proposed offshore sandwinning were identified during the Scoping Phase through an appraisal of the following:

- Project-related components and infrastructure (see Section 7);

- Activities associated with the project life-cycle (i.e. pre-construction, construction, operation and decommissioning) (see Section 7);
- Proposed alternatives (see Section 6);
- Nature and profile of the receiving environment and potential sensitive environmental features and attributes (see Section 12), which included a desktop evaluation (via literature review, GIS, topographical maps and aerial photography) and site investigations; and
- Legal and policy context (see Section 8).

Apart from explaining the receiving environment, Section 12 discusses possible impacts during offshore sandwinning process. The significant environmental issues were distilled from the aforementioned section and are summarised in Section 14.2. Cumulative impacts are briefly explained in Section 14.3.

14.1.2 Mitigation of Impacts

During the EIA stage, a detailed assessment will be conducted to evaluate all potential impacts (paying particular attention to the significant issues listed in the Scoping Report), with input from the project team and requisite Specialist Studies and through the application of the impact assessment methodology contained in Section 15.

Suitable mitigation measures will be identified to manage the environmental impacts according to the following hierarchy:

- Initial efforts should strive to prevent the occurrence of the impact;
- It this is not possible, mitigation should include measures that reduce or minimise the significance of the impact to an acceptable level;
- Remediation and rehabilitation should take place if measures cannot suitably prevent or reduce the impacts, or to address the residual impacts; and
- As a last measure, compensation should be employed as a form of mitigating the impacts associated with a project.

The mitigation measures will be incorporated into the EMPr, which will form part of the EIA Report. This deliverable, together with the Environmental Authorisation, can act as a standalone document that can be used inter alia to monitor against compliance of the project with its pre-determined objectives, targets and management actions.

14.2 Summary of Environmental Issues

Pertinent environmental issues, which will receive specific attention during the EIA Phase, are listed in **Tables 12** which follow, as well as the Specialist Studies or resolutions to determine the extent of the impact and the propose mitigation measures:

Table 12: Pertinent Environmental Issues for prioritisation during the EIA Phase

Environmental Feature	Potential Impacts/Implications	Specialist Study Required/Proposed Resolution
Climate	Greenhouse gas emissions from Dredgers	EMPr
Maritime Archaeology	Impacts to shipwrecks or other sensitive underwater heritage	Underwater Heritage Impact Assessment
Tourism	Impacts of increased sedimentation on beach users and uShaka Marine World; and Impacts of shoreline erosion or accretion on beach users and uShaka Marine World.	Wave Modelling Study
Geology	The proposed development will not impact directly on geology. The type of geology however may impact on the turbidity of the activity.	Marine Impact Assessment Council of Geociences 2001 Geotechnical Study EMPr
Bathymetry	Changes to bathymetry at the proposed offshore sandwinning sites and related impacts on wave action.	Wave Modelling Study
Marine Sensitivity	No expected impact on MPAs or CBAs.	Marine Impact Assessment
Turbidity	Impacts of dredging on water quality (increased turbidity) and related impacts on benthic organisms, fish, crustaceans and water birds.	Marine Impact Assesment
Marine Biota	Physical impacts of dredging on offshore sand winning site; Impacts of dredging on water quality and related impacts on benthic organisms, fish, crustaceans and water birds; and Potential for Shoreline erosion due to change in sea floor bathymetry at offshore sand winning site.	Marine Impact Assessment Wave Modelling Study
Socio-Economic Environment	Positive impacts related to development within the Port of Durban.	N/A

14.3 Cumulative Impacts

According to GN No. R. 982 (04 December 2014), a “cumulative impact”, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Cumulative impacts can be identified by combining the potential environmental implications of the proposed project with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

As mentioned, results from a recent study, by Corbella and Stretch (2012), show that beaches within The Durban Bight have been gradually receding over the past 4 decades. This is directly attributed to a decrease in sediment being deposited on the beaches as a result of reduced littoral transport. It is suggested that terrestrial anthropogenic activities such as dam construction and mining of river sand have reduced sediment supply and constitute an important factor in the observed erosion trends. Added to this are the effects of an annual rise in sea level estimated at 2.7mm ± 0.05mm per year at a 95% confidence level (Mather 2007). The proposed offshore sandwinning will affect the bathymetry of the site and this may have impacts on the waves and related deposition rates of sand on the beaches. This will be assessed in more detail in the Wave Modelling Study.

Another potential cumulative impact is that of increased turbidity however this will be asseseed in more detail as part of the Marine Impact Assessment.

15 METHODOLOGY TO ASSESS THE IDENTIFIED IMPACTS

Information provided by specialists will be used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation:

Overall Score = (NxMxS)x(E+D+P)

Where:

N = Nature

E = Extent

M = Magnitude

D = Duration

P= Probability

S= Significance

Table 13: Impact Assessment Methodology

Nature				
Negative		Neutral		Positive
-1		0		+1
Extent				
Local	Regional		National	International
1	2		3	4
Magnitude				
Low		Medium		High
1		2		3
Duration				
Short Term (0-5yrs)	Medium Term (5-11yrs)		Long Term	Permanent
1	2		3	4
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain
1	2	3	4	5
Significance				
No Impact/None	No Impact After Mitigation/Low		Residual Impact After Mitigation/Medium	Impact Cannot be Mitigated/High
0	1		2	3

For example, the worst possible impact score of -117 would be achieved based on the following ratings:

N = Nature = -1

M = Magnitude = 3

S = Significance = 3

E = Extent = 4

D = Duration = 4

P= Probability = 5

Worst impact score = (-1 x 3 x 3) x (4+4+5) = -117

On the other hand, if the nature of an impact is 0 (neutral or no change) or the significance is 0 (no impact), then the impact will be 0.

Impact Scores will therefore be ranked in the following way:

Table 14: Ranking of Overall Impact Score

Impact Rating	Low/Acceptable impact	Medium	High	Very High
Score	0 to -30	-31 to -60	-61 to -90	-91 to -117

16 PLAN OF STUDY FOR EIA

This Plan of Study, which explains the approach to be adopted to conduct the EIA for the proposed offshore sandwinning, was prepared in accordance with 2 (i) of Appendix 2 of GN No. R. 982 (04 December 2014).

16.1 Key Environmental Issues Identified During Scoping Phase

The Scoping exercise aims to identify and qualitatively predict significant environmental issues for further consideration and prioritisation during the EIA stage. These include issues raised by IAPs to date. Further comments from IAPs during the Scoping Phase will also guide the identification of significant issues.

During the EIA stage, a detailed quantitative impact assessment will be conducted via contributions from the project team and requisite Specialist Studies, and through the application of the impact assessment methodology contained in Section 15. Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts, and will be included in an EMPr.

Key environmental issues identified during Scoping, which will receive specific attention during the EIA Phase are listed in **Table 12**.

16.2 Environmental Specialist Studies

According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*".

Further, the 2014 EIA Regulations define a specialist as: "*A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies*."

The requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include:

- Marine Impact Assessment; and
- Underwater Heritage Impact Assessment.

The Terms of Reference (ToR), both general and specific, for the abovementioned specialist studies follow in the sub-sections below. Amongst others, the Guideline for determining the scope of specialist involvement in EIA processes (Münster, 2005) was used in compiling the general Terms of Reference for the Specialist Studies. The following guidelines were also employed to prepare the specific ToR for the respective specialists (where appropriate):

- Guideline for involving biodiversity specialists in EIA processes (Brownlie, 2005);
- Guideline for involving social assessment specialists in EIA processes (Barbour, 2007); and
- Guideline for involving heritage specialists in EIA processes (Winter & Baumann, 2005).

In addition to the above guidelines, the relevant specialists need to satisfy specific requirements stipulated by the following key environmental authorities:

- DEA;
- eThekwini Metropolitan Municipality;
- DWS;
- DMR;
- DAFF; and
- PHRAG.

For the inclusion of the findings of the Specialist Studies into the EIA report, the following guideline will be used: Guideline for the review of specialist input in EIA processes (Keatimilwe & Ashton, 2005). Key considerations will include:

- Ensuring that the specialists have adequately addressed IAPs' issues and specific requirements prescribed by environmental authorities;
- Ensuring that the specialists' input is relevant, appropriate and unambiguous; and
- Verifying that information regarding the receiving ecological, social and economic environment has been accurately reflected and considered.

16.2.1 General Terms of Reference

1. Address all triggers for the specialist studies contained in the subsequent specific ToR.
2. Address issues raised by IAPs, as contained in the Comments and Responses Report, and conduct an assessment of all potentially significant impacts.

3. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied.
4. Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.
5. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
6. Consider time boundaries, including short to long-term implications of impacts for project life-cycle (i.e. pre-construction, construction, operation and decommissioning).
7. Consider spatial boundaries, including:
    a. Broad context of the proposed project (i.e. beyond the boundaries of the specific site);
    b. Off-site impacts; and
    c. Local, regional, national or global context.
8. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.
9. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
10. Appraisal of alternatives (including the No-Go option) by identifying the Best Practicable Environmental Option (BPEO) with suitable justification.
11. Advise on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.
12. Engage with other specialists whose studies may have bearing on your specific investigation.
13. Information provided to the EAP needs to be signed off and a Specialist Declaration form of Independence will need to be signed.
14. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.
15. Attend one specialist integration meeting.
16. Present findings at the public meeting.

17. All specialist reports must adhere to Appendix 6 of GN No. R. 982 (04 December 2014).

16.2.2 Specific Terms of Reference

16.2.2.1 Marine Impact Assessment

A summary of key issues & triggers Identified during Scoping include the following:

- Offshore Sand Winning will result in the physical removal of the benthic community.
- Increased turbidity may impact visual predators in the area of dredging at the Offshore Sand winning Site.

The approach to be followed is as follows:

- Undertake baseline survey (reconnaissance) and describe affected environment within the project footprint from a biodiversity perspective.
- Undertake desktop study (literature review, topographical maps and aerial photographs) and baseline survey and describe the offshore sand winning site.
- Take into consideration the provincial conservation goals and targets and identify existing and future planned conservation areas.
- Assess the current ecological status and the conservation priority within the project footprint and adjacent area (as deemed necessary). Provide a concise description of the importance of the affected area to biodiversity in terms of pattern and process, ecosystem goods and services, as appropriate.
- Undertake sensitivity study to identify protected and conservation-worthy species. Prepare a biodiversity sensitivity map with the use of GIS, based on the findings of the study.
- Identify potential fatal flaws associated with the project and its alternatives from a biodiversity perspective.
- Provide suitable mitigation measures to safeguard sensitive features.
- Determine ecological status of the receiving marine environment, including the identification of endangered or protected species.

Details of the nominated specialist are as follows:

Organisation:	Anchor Environmental Consultants
Name:	Barry Clark
Qualifications:	PhD- Marine Biology
No. of years experience:	15
Affiliation (if applicable):	• Professional Natural Scientist: South African Council for Natural Scientific Professions • Professional Member of South African Institute of Ecologists and Environmental Scientists • South African representative to the SURVAS Network

	(Synthesis and Upscaling of Sea-level Rise Vulnerability Assessment Studies) • Member of International Association of Impact Assessors (IAIA) • Member of Subsistence Fisheries Advisory Group • Member of the South African Network for Coastal and Oceanic Research (SANCOR) Economics Task Team

16.2.2.2 Underwater Heritage Impact Assessment

A summary of key issues & triggers Identified during Scoping include the following:

- Potential occurrence of heritage resources such as shipwrecks within the dredging at the Offshore Sand winning site.

The approach to be followed is as follows:

- Undertake a Phase 1 Heritage Impact Assessment in accordance with the South African Heritage Resources Act (No. 25 of 1999).
- The identification and mapping of all heritage resources in the area affected, as defined in Section 2 of the National Heritage Resources Act, 1999, including archaeological and palaeontological sites on or close (within 100 m) of the proposed development including the dredging footprint, expansion footprint, and offshore sand winning site.
- An assessment of the significance of such resources in terms of the heritage assessment criteria as set out in the regulations.
- An assessment of the impact of development on such heritage resources.
- Prepare a heritage sensitivity map (GIS-based), based on the findings of the study.
- Identify heritage resources to be monitored.
- Comply with specific requirements and guidelines of SAHRA – Maritime Archaeology Unit.

Details of the nominated specialist are as follows:

Name:	Vanessa Maitland
Qualifications:	B.A. (Hons) – Archaeology
No. of years experience:	8 years
Affiliation (if applicable):	Association for South African Professional Archaeologists

16.3 Technical Specialist Studies

In addition to the above mentioned environmental studies, a Wave Modelling Techncial Study and geotechnical assessment will also be undertaken and included in the EIA Report.

This study will be undertaken by the following technical specialist:

Organisation:	ZAA Engineering Projects and Naval Architecture (Pty) Ltd
Name:	Dr John Zietsman
Qualifications:	BSc (CivEng), UCT, MSc (Ocean Eng) University College London, PhD University of London
No. of years experience:	39
Affiliations	PrEng, FSAICE, MICE, MRINA (overseas), MSNAME, FSAAE, CEng

16.4 Public Participation – EIA Phase

16.4.1 Notification – Approval of Scoping Report and Notification of Public Review of Draft EIA Report

IAPs will be notified of the approval of the Scoping Report and the public review period of the Draft EIA Report at the same time.

Registered IAPs will be notified of the approval and review period by emails or SMS. These notices will also include information on the public meeting for the EIA Phase.

16.4.2 EIA Public Meeting

The public meeting details during the EIA Phase will be available in the Draft EIA.

All registered IAPs will be invited to attend the public meeting.

16.4.3 Review of Draft EIA Report

A 30-day review period will be provided to registered IAPs and authorities to review the Draft EIA Report, and details of the venues will be available in the Draft EIA.

All comments received from IAPs and the responses thereto will be included in the Final EIA Report for submission to DMR.

16.4.4 Updating of IAP Database and Comments and Responses Report

The IAP Database and Comments and Responses Report is continuously updated throughout the process and thus registered IAPs will have a chance to review this Comments and Responses Report during the 30-Day public and authority review period of the Draft EIA Report. Again, the public and authorities will be provided with the Final EIA Report in which further comments received by registered IAPs (as well as the minutes of the Public Meeting) will be forwarded to the relevant DMR Official to consider when making the decision whether to grant EA or not.

16.4.5 Notification of GDARDs Decision

All registered IAPs will be notified via email or SMS after having received written notice from DMR on the final decision. Advertisements will also be placed in the Isolezwe newspaper

regarding the Department's decision. These notifications will include the appeal procedure to the decision.

16.5 Proposed Timeframes

The proposed timeframes for the Scoping and EIA Phase is provided in **Table 15**. Note that these dates are subject to change.

Table 15: Scoping and EIA Timeframes (dates may changes during the course of the EIA)

Scoping Phase	Proposed Timeframe
Initial Notification	13 July 2016
Draft Scoping Report Review Period	22 September – 24 October 2016
Public Meeting	5 October 2016
Submit Final Scoping Report to DMR	1 November 2016
Final Scoping Report Review Period	2 November 2016 – 9 January 2017
Notify Registered IAPs of DMR Decision on Final Scoping Report as well as the review period of Draft EIA Report	18 – 20 January 2017
Draft EIA Report Review Period	23 January – 23 February 2017
Public Meeting	13 February 2017
Submit Final EIA Report to DMR	13 March 2017
Final EIA Report Review Period	14 March – 3 July 2017
Notify Registered IAPs of DMR Decision	4 July 2017
Allow Appeal Period	5 - 19 July 2017

17 CONCLUSION

Taking into consideration the findings of the Scoping process, the EIA will need to conduct detailed investigations for the significant environmental issues identified.

It is the opinion of the EIA team that Scoping was executed in an objective manner and that the process and report conform to the requirements of regulations of GN. No. R. 982 (04 December 2014).

It is also believed that the Plan of Study for the EIA is comprehensive and will be adequate to address the significant issues identified during Scoping, to select the BPEO, and to ultimately allow for informed decision-making.

18 OATH OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

I (name and surname) Donavan Hennig

Of (address) 143 Bean Finker Drive Ferndale 2194

ID No. 7612065057080 *Contact No.* 0827815120

I hereby make an oath and state that:

In accordance with Appendix 2 of Government Notice No. R. 982 (4 December 2014), this serves as an affirmation by the Environmental Assessment Practitioner (EAP) in relation to;

Section 2(j) -

1. *The correctness of the information provided in this report;*
2. *The inclusion of comments and inputs from stakeholders and interested and affected parties; and*
3. *Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.*

Section 2(k) -

The level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.

1. I know and understand the contents of this declaration.

2. I do not have any objection in taking prescribed oath.

3. I consider the prescribed oath to be binding on my conscience.

SOUTH AFRICAN POLICE SERVICE
COMMUNITY SERVICE CENTRE
2016 -09- 20

Signature _____ *Date:* 20/09/2016

I certify that the deponent has acknowledged that he/she knows and understands the contents of the statement and the deponent signature was placed there on in my presence.

COMMISSIONER OF OATH | FULL NAME | DESIGNATION

19 REFERENCES

Carter, R. A. & Schleyer, M. H. 1988. Plankton distributions in Natal coastal waters. In: Schumann, E. H. (ed.). Lecture notes on coastal and estuarine studies. Springer-Verlag, Germany. Pp. 152-176.

Celliers, L., Breetzke, T., Moore, L. and Malan, D. 2009. A User-friendly Guide to South Africa's Integrated Coastal Management Act. The Department of Environmental Affairs and SSI Engineers and Environmental Consultants. Cape Town, South Africa.

Corbella, S. and D. D. Stretch. 2012. Decadal trends in beach morphology on the east coast of South Africa and likely causative factors. Natural Hazards and Earth System Sciences 12: 2515-2527.

DEA&DP. 2009. Guideline on Need and Desirability, NEMA EIA Regulations Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP), Cape Town.

DEAT, 2001. South African Estuaries: Catchment Land-Cover. National Summary Report. Prepared by CSIR for the Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT, 2002. Scoping, Integrated Environmental Management, Information Series 2, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT. 2005a. Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005. Integrated Environmental Management Guideline Series. Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT. 2005b. Guideline 4: Public Participation, in terms of the EIA Regulations. Integrated Environmental Management Guideline Series. Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Dye, A. H., McLAchlan, A. & T. Wooldridge. 1981. The ecology of beaches in Natal. South African Journal of Zoology 16: 200-209.

EThekweni Municipallity, 2008. EThekweni Municipallity systematic conservation plan land class layer.

Fennessy S T 1994a – The impact of commercial prawn trawlers on linefish off the north coast of Natal, South Africa. South African Journal of Marine Science 14: 263-280

Fennessy S T. 1994b. Incidental capture of elasmobranchs by commercial prawn trawlers on the Tugela Bank, Natal, South Africa. South African Journal of Marine Science 14: 287-298

Fennessy, S. T., 2000. Aspects of the biology of four species of Sciaenidae from the east coast of South Africa. Estuarine and Coastal Shelf Science. 50: 259-269.

IDP. 2012. Integrated Development Plan: eThekwini Municipality 2011/2012.

Mather A. A, Kasserchun R, and H Wenlock. 2003. City of Durban Sand Bypass Scheme : 20 Year Performance Evaluation. COPEDEC VI, Colombo, Sri Lanka. 15 pp.Mather A. A. 2007. Linear and nonlinear sea-level changes at Durban, South Africa. South African Journal of Science 103: 509-512.

McClurg, T.P. 1998. Benthos of the Natal continental shelf. In Schumann, E.H. 1998 (Ed.). Lecture notes on coastal and estuarine studies. 26. Coastal Ocean Studies off Natal, South Africa. Springer-Verlag, Berlin, pp. 178-208.

MER/ERM (2011). “Development of the Bay of Natal Estuarine Management Plan: Situation Assessment.” Report prepared for eThekwini Municipality, Transnet National Port Authority and the Department of Agriculture, Environmental Affairs and Rural Development.

Council of Geosciences. 2001. A geophysical and sediment sampling survey of two proposed sand winning areas in the Durban Bight. Report prepared by Council for Geosciences, Marine Geoscience Unit, Durban. Report No. 2001-0158. 27 pp.

Porter, S.N. 2009. Biogeography and potential factors regulating shallow subtidal reef communities in the western Indian Ocean. PhD thesis. University of Cape Town. Available at: http://drseanporter.weebly.com/phd-thesis.html

Raymont, J.G. 1983. Plankton and productivity in the oceans. Zooplankton. Pergamon Press. 824 pp.

SABAP 2. 2012. The South African Bird Atlas Project 2. Available at: http://sabap2.adu.org.za/ accessed July 2012.

Schleyer, M.H. 1981. Microorganisms and detritus in the water column of a subtidal reef off Natal. Marine Ecology Progress Series 4: 307-320.

Shumann, E.H. 1998. Physical Oceanography off Natal. In Schumann, E.H. 1998 (Ed.). Lecture notes on coastal and estuarine studies. 26. Coastal Ocean Studies off Natal, South Africa. Springer-Verlag, Berlin, pp. 131-151.

Sink, K., Holness, S., Harris, L., Majiedt, P., Atkinson, L., Robinson, T., Kirkman, S., Hutchings, L., Leslie, R., Lamberth, S., Kerwath, S., von der Heyden, S., Lombard, A., Attwood, C., Taljaard, S., Weerts, S., Cowley, P., Awad, A., Halpern, B., Grantham, H. and Wolf, T., 2011. National Biodiversity Assessment 2011: Marine Component. Volume 4. Technical Report: South African National Biodiversity Institute. Pp 227.

Steffani, N, Pulfrich, A, Carter, R and Lane, S (2003). Environmental impact assessment for the expansion of the container terminal stacking area at the Port of Cape Town – Marine

ecological aspects. Draft report by PISCES Environmental Services, R Carter Specialist Consultant and Sue Lane and Associates.

TEMPI (2007). Transnet-eThekwini Joint Port Planning Project – Economic Workstream.

Van Coller,J., Maasdorp, G., and Mavundla, K. 2011. Durban Maritime Industry: A Value Chain Analysis. Unpublished Report.

Van der Elst, R. 1988. Shelf Ichthyofauna of Natal. In: Schumann, E.H. (Ed.) Lecture notes on coastal and estuarine studies. 26. Coastal Ocean Studies off Natal, South Africa. Springer-Verlag, Berlin, pp. 209-225.