

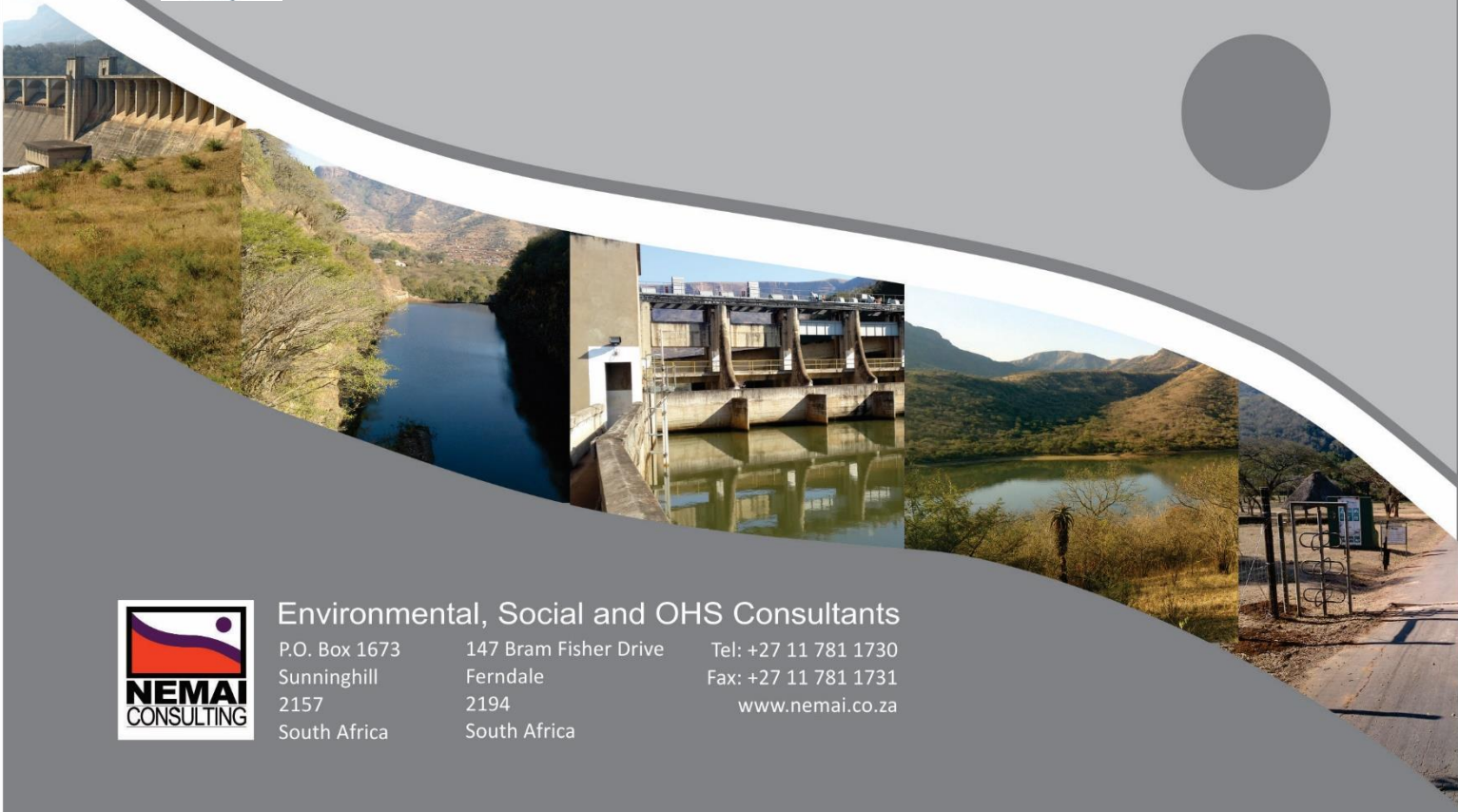
PROPOSED UPGRADE OF THE EXISTING SHIP REPAIR FACILITY AT THE PORT OF MOSSEL BAY, WESTERN CAPE

BASIC ASSESSMENT REPORT

OCTOBER 2018

DRAFT

PREPARED FOR: TRANSNET NATIONAL PORTS AUTHORITY (TNPA)



Environmental, Social and OHS Consultants

P.O. Box 1673
Sunninghill
2157
South Africa



147 Bram Fisher Drive
Ferndale
2194
South Africa

Tel: +27 11 781 1730
Fax: +27 11 781 1731
www.nemai.co.za

Title and Approval Page

Project Name:	PROPOSED UPGRADE OF THE EXISTING SHIP REPAIR FACILITY AT THE PORT OF MOSSEL BAY, WESTERN CAPE
Report Title:	Basic Assessment Report
Authority Reference:	Not yet assigned by DEA, will be assigned after Application is submitted
Report Status:	Draft

Applicant:	Transnet National Ports Authority (TNPA)
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Prepared By:	Nemai Consulting			
		+27 11 781 1730		147 Bram Fischer Drive, FERNDALE, 2194
		+27 11 781 1731		
		kristyr@nemai.co.za		PO Box 1673, SUNNINGHILL, 2157
		www.nemai.co.za		
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Authors: D. Henning, N. Naidoo and K. Robertson
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Executive Summary

Project Background and Motivation

Nemai Consulting was appointed by Transnet National Ports Authority (TNPA) as the Independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment Process for the proposed upgrade of the existing ship repair facility at the port of Mossel Bay in Western Cape in accordance with the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the 2014 Environmental Impact Assessment (EIA) Regulations, as amended (07 April 2017). This document serves as the Draft Basic Assessment Report (BAR) for the aforementioned project.

The Port of Mossel Bay has an approximately 87 year old end haul type slipway currently installed, the purpose of which is to allow for the repair of ships/vessels. Due to a lack of maintenance and an incident that occurred in 2005, the facility has become unsafe and the permissible maximum vessel light displacement has been reduced from 500 Tonnes to 200 Tonnes. Prior to the facility being declared unsafe in November 2005, it serviced an average of 43 vessels a year (based on counts for three years preceding 2005). The lead-in jetties are also in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties. There is also an operations building on the site that was constructed at the same time as the slipway. The building is old, of outdated construction and does not meet the Port's future operational requirements.

The primary drivers for the proposed development are based on:

- The National Government initiative called Operation Phakisa which is linked to the National Development Plan;
- The existing aged infrastructure that has become unsafe due to a lack of maintenance and is therefore operated below its design capacity; and
- The existing infrastructure that is not used to its full existing operational capacity (simultaneous dry-docking of two vessels).

Not only will the proposed upgrade fall under the Operation Phakisa Initiative, but it also introduces other features, like side slipping, which would serve the following purposes:

- Increase the facilities' utilisation;
- Increase revenue generation for TNPA;
- Modernize the facility; and
- Increase the safety at the site.

Project Location

Mossel Bay is located in the Western Cape, approximately halfway between Cape Town and Port Elizabeth. The Port of Mossel Bay is situated by the coast, north-east of the town of Mossel Bay, falling within the Eden District Municipality and Mossel Bay Local Municipality.

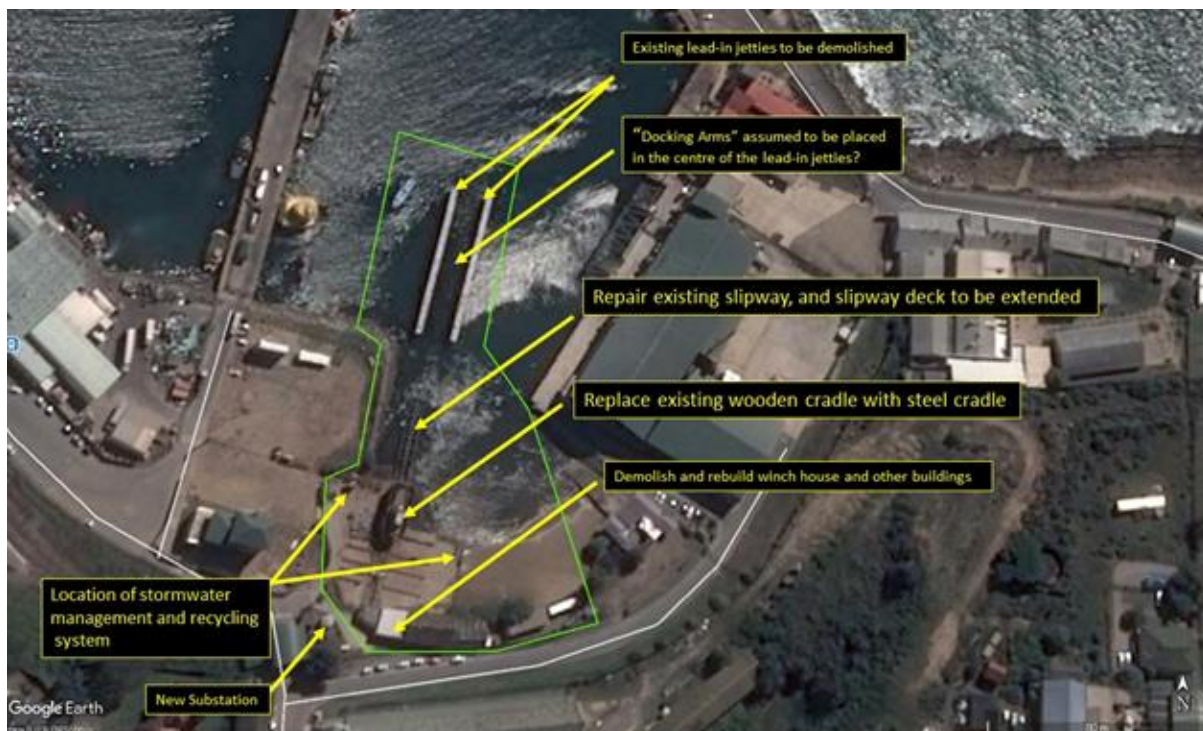


Locality Map

Project Description

The scope of work associated with the proposed project includes the following:

1. Demolish the existing wooden lead-in jetties;
2. Install Docking Arms;
3. Repair existing slipway and the surface of the sideslip will be expanded by approximately 300 square meters;
4. Replace existing wooden cradle with steel cradle;
5. Demolish and rebuild winch house and associated buildings;
6. Provide a stormwater management and recycling system;
7. Installation of a 1 MVA Substation; and
8. Upgrade services for electrical, sewer, water (salt and fresh), compressed air, lighting, sideslip yards, working area surfacing, and bunding.



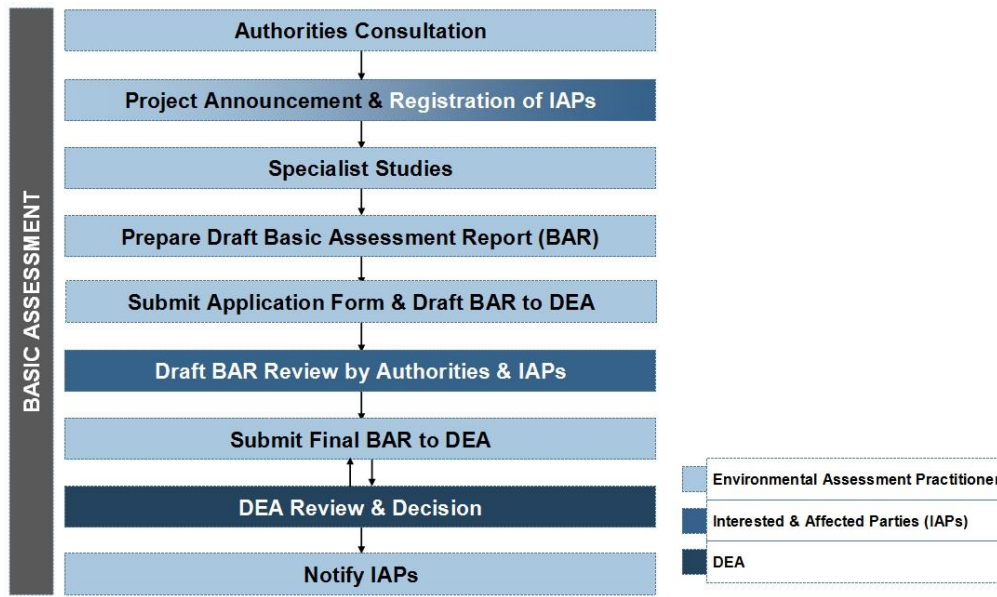
Scope of Work

Legislation and Guidelines Considered

The pertinent environmental legislation that has bearing on the proposed development is considered in the BAR. The proposed upgrade of the existing ship repair facility requires authorisation in terms of the NEMA, and the BAR was undertaken in accordance with the 2014 EIA Regulations (as amended on 07 April 2017). A description of the policy and legislative context within which the development is proposed includes 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.

Basic Assessment Process

In terms of the EIA Regulations, the lead decision-making authority for the Basic Assessment (BA) Process is the Department of Environmental Affairs (DEA) as the project proponent is TNPA. An outline of the BA Process for the proposed upgrade of the existing ship repair facility is provided below.



BA Process

Environmental Attributes

The BAR provides general description of the status quo of the receiving environment in the project area. It allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed development.

The following environmental features have been considered:

1. Geology and Soil;
2. Marine Environment;
3. Socio – Economic Environment;
4. Air Quality;
5. Noise;
6. Historical and Cultural Features;
7. Transportation;
8. Aesthetic Qualities; and
9. Existing Infrastructure.

Specialist Studies

The following Specialist Studies were undertaken as part of the BA Process:

1. Marine Impact Study; and
2. Phase 1 Heritage Impact Assessment.

Summaries of these specialist studies are included in the BAR.

Impact Assessment

The BAR focuses on the pertinent environmental impacts that could potentially be caused by the proposed upgrade of the ship repair facility during the pre-construction, construction and operational phases of the project.

The impacts and the proposed management measures are discussed on a qualitative level and thereafter quantitatively assessed by evaluating the nature, extent, magnitude, duration, probability and ultimately the significance of the impacts. The assessment considered impacts before and after mitigation, where in the latter instance the residual impact following the application of the mitigation measures is evaluated.

The proposed mitigation of the impacts associated with the project includes specific measures identified by the technical team and environmental specialists, stipulations of environmental authorities and environmental best practices. The Environmental Management Programme (EMPr) provides a comprehensive list of mitigation measures for specific elements of the project, which extends beyond the impacts evaluated in the body of the BAR.

Public Participation

The BAR provides a full account of the public participation process that was followed for the proposed project. A 30-Day Authority and Public Review Period of the Draft BAR will take place from 15 October 2018 to 13 November 2018.

All authorities and registered Interested and Affected Parties (IAPs) will be notified via email or SMS after having received written notice from DEA on the final decision for the project. Advertisements will also be placed as notification of the Department's decision. These notifications will include the appeal procedure to the decision and key reasons for the decision.

EIA Conclusion and Recommendations

An Environmental Impact Statement is provided and critical environmental activities that need to be executed during the project lifecycle are also presented.

With the selection of the best practicable environmental option (Alternative 1), the adoption of the mitigation measures included in this report, and the dedicated implementation of the EMPr, it is believed that the significant environmental aspects and impact associated with this project can be suitably mitigated. With the aforementioned in mind, it can be concluded that there are no fatal flaws associated with the project and that authorisation can be issued, based on the findings of the specialists and the impact assessment, through the compliance with the identified environmental management provisions. In conclusion, it is recommended that the proposed upgrade of the ship repair facility in Mossel Bay should be authorised.

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List of Abbreviations

BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Areas
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DM	District Municipality
DSP	Dumping at Sea Permit
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Areas
GN	Government Notice
HIA	Heritage Impact Assessment
IAPs	Interested and Affected Party
IDP	Integrated Development Plan
LM	Local Municipality
NEMA	National Environmental Management Act (Act No. 107 of 1998)
OHS	Occupational Health and Safety
RMU	Ring Main Unit
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SIP	Strategic Integrated Project
TNPA	Transnet National Ports Authority
Tons	Tonnes
WUL	Water Use License
WULA	Water Use License Application

1 DOCUMENT ROADMAP

This document serves as the Draft Basic Assessment Report (BAR) for the proposed upgrade of the existing ship repair facility at the port of Mossel Bay, Western Cape. In order to provide clarity to the reader, a document roadmap is provided in **Table 1** below. The document roadmap provides information on the requirements of the 2014 Environmental Impact Assessment (EIA) Regulations, as amended (07 April 2017), as stipulated in Appendix 1 of Government Notice (GN) No. R. 982, as promulgated in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) 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 these EIA Regulations.

Table 1: Document Roadmap

Chapter	Title	Correlation with GN No. 982 – Appendix 1	
1.	Document Roadmap	–	–
2.	Purpose of the Document	–	–
3.	Environmental Assessment Practitioner	3(1)(a)	(a) Details of – (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including curriculum vitae.
4.	Project Background and Motivation	3(1)(b, c and d)	(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; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; (c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure 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 to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken; (d) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure;
5.	Project Location		
6.	Project Description		
7.	Project Alternatives		

Chapter	Title	Correlation with GN No. 982 – Appendix 1	
8.	Legislation and Guidelines Considered	3(1)(e)	(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;
9.	Basic Assessment Process	–	–
10.	Assumptions and Limitations	3(1)(o)	(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;
11.	Need and Desirability	3(1)(f)	(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;
12.	Timeframes	3(1)(q)	(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;
13.	Financial Provisions	3(1)(s)	(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;
14.	Public Participation Process	3(1)(h)	(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
15.	Environmental Attributes	3(1)(h)	(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
16.	Summary of Specialist Studies	3(1)(k and m)	(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report; (m) based on the assessment, and where applicable, impact management measures from specialist reports,

Chapter	Title	Correlation with GN No. 982 – Appendix 1	
			the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;
17.	Impact Assessment		<p>(h) a full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <p>(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-</p> <p>(aa) can be reversed;</p> <p>(bb) may cause irreplaceable loss of resources; and</p> <p>(cc) can be avoided, managed or mitigated;</p> <p>(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;</p> <p>(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;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p>
18.	Impact Management	3(1)(h, i and j)	<p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p> <p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p> <p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be avoided, managed or mitigated;</p>

Chapter	Title	Correlation with GN No. 982 – Appendix 1	
19.	Analysis of Alternatives	3(1)(g, k, l, m, n, and p)	(g) a motivation for the preferred site, activity and technology alternative; (k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report; (l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; (m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr; (p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
20.	Conclusions and Recommendations		
21.	Oath of Environmental Assessment Practitioner	3(1)(r)	(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties;
N/A		3(1)(t)	Where applicable, any specific information required by the Competent Authority.
N/A		3(1)(u)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act.

The following is included in the Appendices to meet the requirements of the 2014 EIA Regulations, as amended:

Appendix	Title	Correlation with GN No. R. 982
7	Environmental Management Programme (EMPr)	Appendix 4
6	Specialist Studies	Appendix 6

2 PURPOSE OF THE DOCUMENT

According to GN No. R. 982 of the 2014 EIA Regulations, as amended (07 April 2017), the objective of the Basic Assessment (BA) Process is, through a consultative process, to:

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine–
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts–
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to–
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

The Draft BAR will be made available to Interested and Affected Parties (IAPs) for a 30-Day Review Period **from 15 October 2018 to 13 November 2018**. All comments that are received will be assessed in the Final BAR and will also be included in the Comments and Response Report (CRR). The Final BAR will then be submitted to the Department of Environmental Affairs (DEA), the Competent Authority in respect to this proposed development.

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nemai Consulting was appointed by Transnet National Ports Authority (TNPA) as the Independent Environmental Assessment Practitioner (EAP) to undertake the BA Process for the proposed upgrade of the existing ship repair facility at the port of Mossel Bay, Western

Cape. In accordance with Section 3(1)(a) of Appendix 1 of GN No. R. 982 of the 2014 EIA Regulations (as amended), this section provides an overview of Nemaï Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the BA team.

Nemaï 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 Nemaï Consulting that are involved in the BA Process for the proposed project are captured in **Table 2** below, and their respective Curricula Vitae are contained in **Appendix 1**.

Table 2: BA core team members

Name	Qualification	Responsibility
Mrs N. Naidoo	BSc Eng (Chem)	Project Manager and Environmental Engineering
Ms K. Robertson	MSc Environmental Sciences	Project Leader, EAP and Public Participation
Mr D. Henning	MSc Zoology	EAP
Mr C. Van Der Hoven	BSc (Honours) Environmental Sciences	Public Participation

4 PROJECT BACKGROUND AND MOTIVATION

4.1 Existing Ship Repair Facility

The Port of Mossel Bay has an approximately 87 year old end haul type slipway currently installed, the purpose of which is to allow for the repair of ships/vessels. The existing ship repair facility at the Port of Mossel Bay (**Figure 1**) is located in the south east portion of the port and comprises of the following:

- Two wooden lead-in jetties;
- A wooden cradle to haul vessels out of the water;
- A concrete beam and pile, end haul type slipway with two side slip yards;
- Winch house; and
- Administration building, stores and workshops.

Refer to **Figure 2** for a ground view of the facility.



Figure 1: Aerial view of the ship repair facility

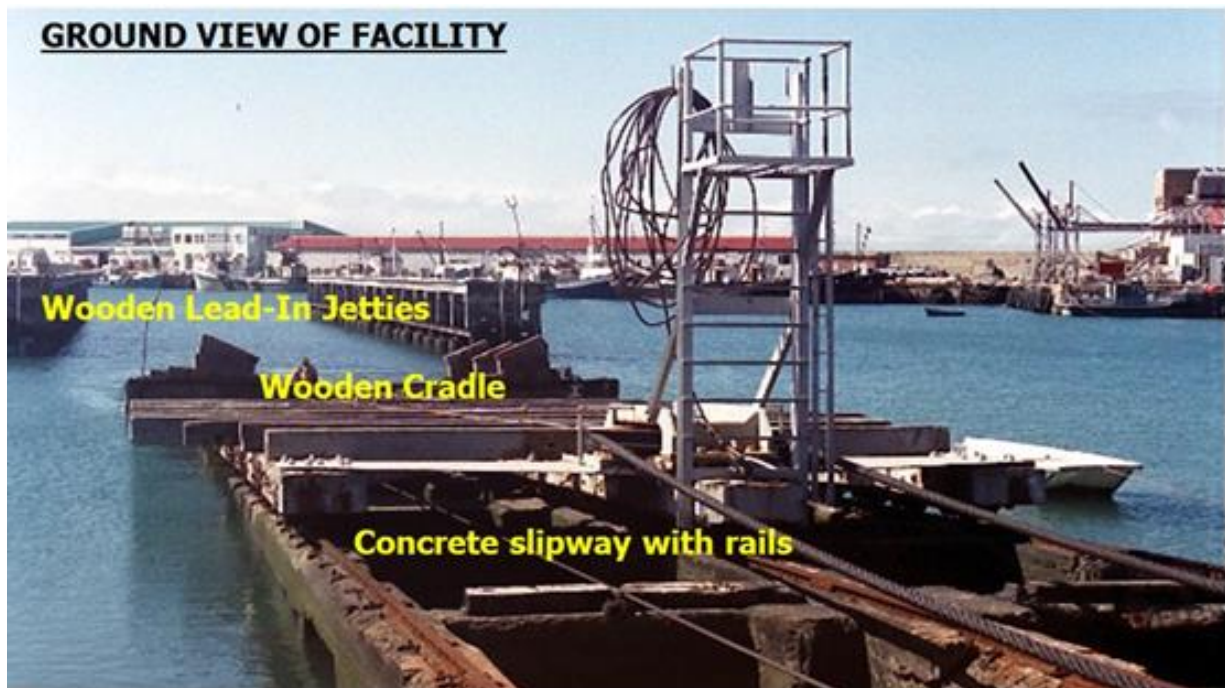


Figure 2: View from land to water showing slipway and jetties

Figure 3 shows the entry into the Mossel Bay Port. The photographs to follow show the existing components of the infrastructure to be upgraded as part of this project.



Figure 3: Entry into the Port of Mossel Bay

4.1.1 Two wooden lead-in jetties

The two wooden lead-in jetties on either side of the wooden cradle are approximately 62m long and supported on wooden piles (**Figure 4**).



Figure 4: View of the wooden lead-in jetties

4.1.2 Wooden cradle to haul vessels out of the water

The existing cradle is made from wood and is supported by a 3-way system (**Figures 5 and 6**). The cradle was originally constructed as a 42m long structure but had a section cut-off around 10 years ago, reducing its effective length to 35m.



Figure 5: A ship on the existing wooden cradle



Figure 6: Close-up view of the existing wooden cradle

4.1.3 Concrete beam and pile, end haul type slipway with two side slip yards

The slipway (**Figure 7**) extends northward from the winch house to about the midway span of the lead-in jetties (which is about 130m). The slipway has rails secured to reinforced concrete beams. It is equipped with a wooden cradle which moves up and down the slipway using a cable mounted in the winch house (**Figure 8**).



Figure 7: Existing slipway

4.1.4 Winch house

The winch house controls the movement of the wooden cradle on the slipway (**Figure 8**).



Figure 8: Existing winch house

4.1.5 Administration building, stores and workshops

There is an operations building (**Figure 9**) on the site that was constructed at the same time as the slipway, located to the east of Gate 2 entrance. The walls are made up of corrugated iron on the outside and Masonite board on the inside.



Figure 9: Operations building

Refer to **Appendix 3** for additional photographs of the study area.

4.2 Operation Process of the Ship Repair Facility

Vessels wanting to mount the slipway cradle must go to a 'dead ship' condition as they approach the jetties. The slipway facility is of the end haul type, meaning that a ship/vessel is positioned between the two wooden lead-in jetties where it is then pulled/hailed out of the water. The ship is manhandled by pulling the vessel ropes, this is done by the berthing crew standing on both of the lead-in jetties. Currently, 4 men per rope are used. The vessel is then hauled toward the land side till the vessel keel interfaces with the wooden cradle of the concrete beam slipway (**Figure 10**). The vessel thus comes in centrally over the submerged cradle to ensure that a vessel will be able to be grounded onto the submerged cradle.

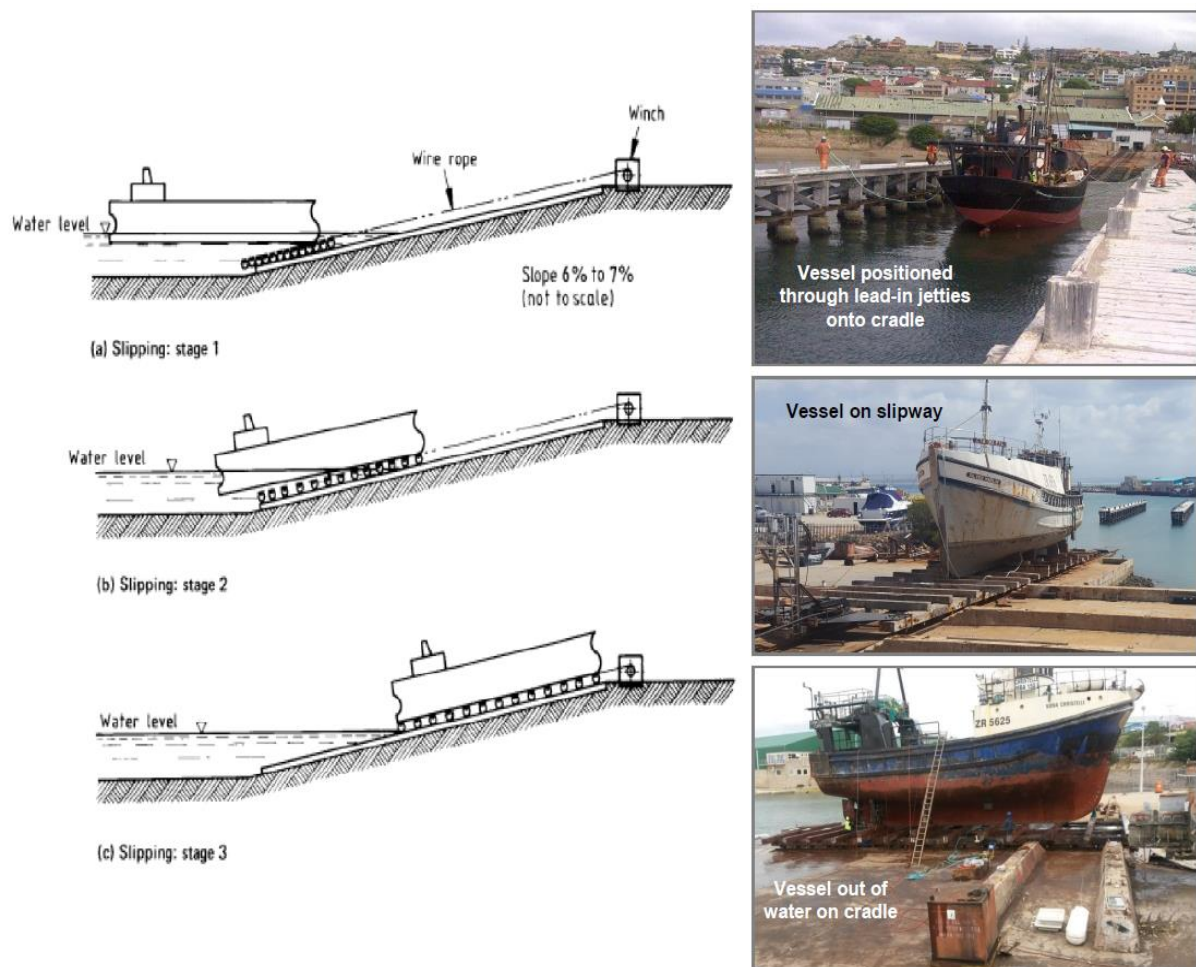


Figure 10: Illustration of facility operation

The facility provides dry docking for TNPA vessels and fishing vessels frequenting the Port of Mossel Bay and working in the surrounding waters. Most vessels utilising the slipway do so for hull inspection (periodic, legislative compliance requirement), cleaning and re-corrosion protection application activities (**Figure 11**). However, the ship repair facility has not been used for years now, the reasons for which will be discussed below motivating the need for the upgrade of the facility.



Figure 11: Vessel on the slip for hull inspection and new corrosion protection application

4.3 The need to upgrade the Ship Repair Facility

The slipway was originally designed to service vessels having a maximum light displacement tonnage of 500 long tonnes (Tons) and for accommodating side slipping, where vessels were brought to land on the main cradle and then shifted off the main cradle to either side of it. Some of the side slipping infrastructure, like the upstand concrete beams, are still present at the site. Side slipping has however not been practiced at the slipway for the last 50 years at least. The Port of Mossel Bay intends to undertake side slipping activities in future.

Due to a lack of maintenance and an incident that occurred in 2005, the facility has become unsafe and the permissible maximum vessel light displacement has been reduced from 500 Tons to 200 Tons. Prior to the facility being declared unsafe in November 2005, it serviced an average of 43 vessels a year (based on counts for three years preceding 2005). The lead-in jetties are also in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties. There is also an operations building on the site that was constructed at the same time as the slipway. The building is old, of outdated construction and does not meet the Port's future operational requirements.

The primary drivers for the proposed development are based on:

- The National Government initiative called Operation Phakisa which is linked to the National Development Plan;
- The existing aged infrastructure that has become unsafe due to a lack of maintenance and is therefore operated below its design capacity; and

- The existing infrastructure that is not used to its full existing operational capacity (simultaneous dry-docking of two vessels).

The proposed development of the proposed ship repair facility at the Port of Mossel Bay is focused on achieving the strategic Operation Phakisa goals of efficiency and economic improvement by:

- Providing a technologically modern facility that can provide ship repair services both efficiently and safely. Phakisa Focus: Engineering/Infrastructure aspects, alignment with Ports Act and other statutory requirements and technical skills improvement;
- Increasing the volume of vessels handled per year and increasing the size of vessels that can be handled. Phakisa Focus: becoming “port of call” for ship repair on east coast of South Africa;
- Widening the ship repair and support services that can be offered by the Port. Phakisa Focus: Broadening Transnet’s internal skills base;
- Stimulate local and regional supply chain opportunities due to increased vessel handling. Phakisa Focus: Strategic Development Initiatives and empowerment programme; and
- Provide a mechanism for the expansion of employment and training opportunities in ship repair and heavy mechanical industry sectors. Phakisa Focus: training and development focusing on advanced technical skills levels.

Therefore, not only will the proposed upgrade fall under the Operation Phakisa Initiative, but it also introduces other features, like side slipping, which would serve the following purposes:

- Increase the facilities’ utilisation;
- Increase revenue generation for TNPA;
- Modernize the facility; and
- Increase the safety at the site.

5 PROJECT LOCATION

Mossel Bay is located in the Western Cape, approximately halfway between Cape Town and Port Elizabeth (**Figure 12**). The Port of Mossel Bay is situated by the coast, north-east of the town of Mossel Bay (**Figures 13 and 14**), falling within the Eden District Municipality and Mossel Bay Local Municipality. Refer to **Appendix 2** for maps.



Figure 12: Regional locality map



Figure 13: Google Earth locality map of the proposed site in relation to the town of Mossel bay



Figure 14: Google Earth locality map of the proposed site in relation to the Port of Mossel Bay

Below is a description of the property details.

Table 3: Property details of the proposed site

Province	Western Cape Province
District Municipality	Eden District Municipality
Local Municipality	Mossel Bay Local Municipality
Ward Number(s)	Ward 8
Farm Name and Number	Erven 12459 of Mossel Bay
Portion Number	
SG Code	C05100070001245900000
Centre Coordinate of Site Boundary	34°10'49.01S; 22°08'52.87E

6 PROJECT DESCRIPTION

6.1 Scope of Work

The scope of work associated with the proposed project includes the following (**Figure 15**):

1. Demolish the existing wooden lead-in jetties;
2. Install Docking Arms;
3. Repair existing slipway and the surface of the sideslip will be expanded by approximately 300 square meters;
4. Replace existing wooden cradle with steel cradle;
5. Demolish and rebuild winch house and associated buildings;
6. Provide a stormwater management and recycling system;
7. Installation of a 1 MVA Substation; and
8. Upgrade services for electrical, sewer, water (salt and fresh), compressed air, lighting, sideslip yards, working area surfacing, bunding and construction/rehabilitation of substation building, administration building and carpenters and millwright building.

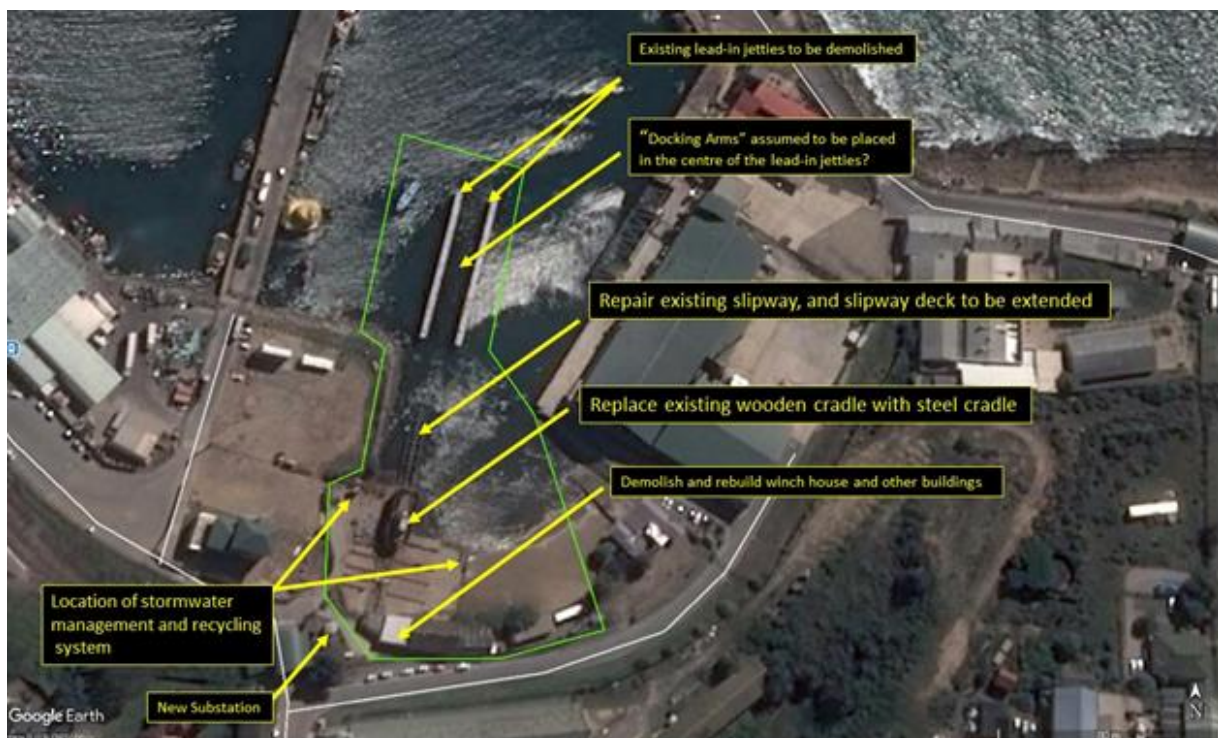


Figure 15: Scope of work

6.1.1 Demolish the existing wooden lead-in jetties

The lead-in jetties (**Figure 16**) are in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties.



Figure 16: Existing lead-in jetties

The condition of the wooden lead-in jetties was assessed. The lead-in jetties are supported on “40off. Greenheart” timber piles with each pile having a square cross-section of 300mm x 300mm. The piles are arranged in bents of two. The piles are secured to each other with diagonal wooden bracing and timber decking. Every second pile on the ships side protrudes above the deck so as to form a bollard for the fixing of the mooring lines. The timber piles are encased in concrete collars within the tidal zone. It appears that this treatment was added to the structure at a later date to protect the piles and is a non-structural element. A vast majority of the timber piles are showing signs of significant damage as a result of destruction of parent wood by unknown marine organisms particularly at the joint between the concrete collar and the pile. In the case of the pile where the concrete collar is knocked away, the marine organisms have “eaten” through the pile.

The commercial diving entity, employed to survey the underwater condition of the slipway concrete beams, also surveyed areas of the jetty piles that were visible. Most of the piles were heavily encrusted with marine growth (**Figure 17**). The divers were instructed not to attempt to chisel away at the growth as the underlying material condition could not be factually ascertained. However, the visual survey of the external exposed piles did not reveal any major cracks or disintegration.



Figure 17: Piles underwater covered in marine growth

Both the wooden bracing and decking show clear signs of disintegration (**Figure 18**). Protective coatings have been previously applied in an attempt to slow down the deterioration, but it is clear that these have either not been applied regularly enough or are ineffective as a solution to slow deterioration. Some of the timber's securing bolts are hot dipped galvanized; others are mild steel and are showing signs of corrosion. The steel plate cladding is also showing signs of significant corrosion. Temporary remedial strengthening of the structure has been attempted previously, via the addition of steel channels bolted to the jetties at a level just above the concrete collar, thus providing some measure of additional bracing between the pile bents. The channels are mild steel, are not galvanized and are showing signs of serious corrosion.

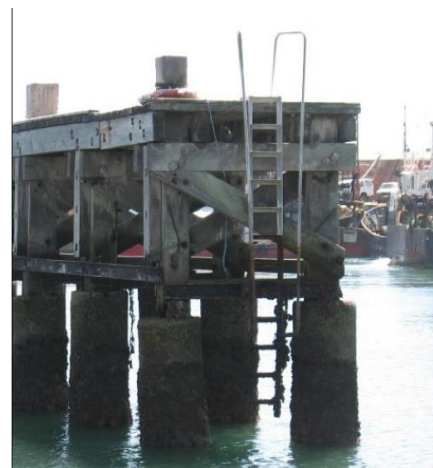


Figure 18: Timber decking disintegrating and wooden cross bracing in poor condition

The existing lead-in jetties will thus be demolished but not re-built as they will become redundant, refer to Section 6.3 below for the solution. The jetties shall be carefully removed

and recovered from the water and transported to the designated laydown area, for handover to TNPA.

6.1.2 Install docking arms

The jetties are operational structures used by berthing crew during vessel berthing operations. The method of berthing currently used is inherently a dangerous operation that is highly weather dependent (making the berthing of a vessel also weather dependent) and is the result of the Port not having capstans to pull in the vessel.

An alternate solution, not requiring the use of the lead-in jetties, for the berthing of vessels on the slipway cradle has been considered (**Figure 19**). Using the newly designed 'docking arms', which are mounted on and move with the cradle, vessels can be firmly secured on the cradle and pulled up to the correct position on the cradle by crew that are on-board the vessel. The docking arms will serve as guide posts for the vessel coming in i.e. the vessel can centralise itself between them, like parking lines.

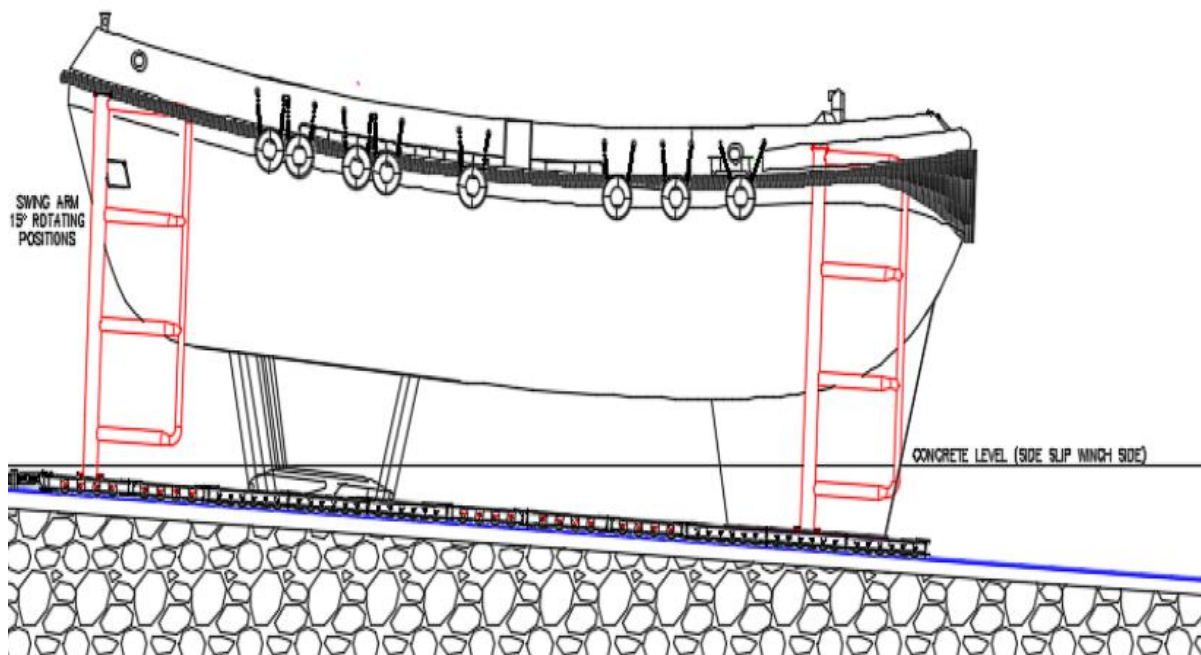


Figure 19: Vessel within cradle swing arms

The side slip cradles will be fitted with 8off, vertically mounted frame structures called docking arms. The frames will be largely fabricated from scheduled pipe and are able to rotate. The docking arms are used by vessel berthing crews to secure the vessels when the vessels are transitioning onto the cradles from the water. The docking arms will be fitted with fenders that offer some protection to vessels should a vessel accidentally bump the arm (**Figure 20**).

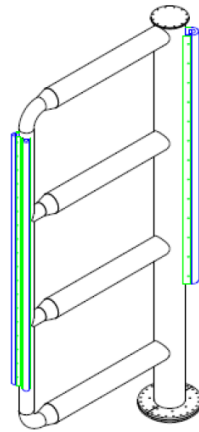


Figure 20: Typical docking arm with fender assembly

6.1.3 Repair existing slipway

The slipway will not be upgraded in respect of its load handling capacity, it is being remediated back to its original capacity. The underwater portion of the rail support beams for the cradle will be rebuilt and above water portions will be repaired.

The condition of the concrete slipway beams below the water line were assessed. The below water structure was inspected by divers and using the footage and photographic data captured by the divers and assessed by a structural engineer. It was found that there were some structural cracks in some of the slipway beams (**Figure 21**).



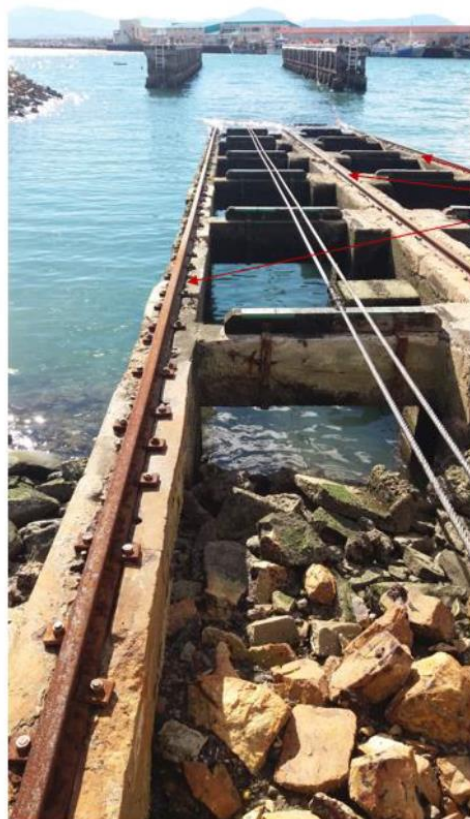
Figure 21: Examples of sever structural cracks in the slipway beams

The slipway rails are fixed to a steel plate which is in turn fixed to the concrete with holding down bolts, nuts and clamps. On all the rails below the water line, a number of holding down bolts, nuts and clamps are missing. On the holding down bolts without nuts there are no thread left on the bolts. In general, the rails are in poor condition (**Figure 22**) and will need to be replaced in their entirety, with the newly selected rails aligning with the design of the new cradle.



Figure 22: Severely corroded underwater rails

The existing slipway super structure between the shore line and the last row of piles supporting the structure will be demolished and a new super structure of the same footprint will be constructed (**Figure 23**)



Demolition of
concrete beams and
construction of new
beams – From
Shoreline to end of
lead-in jetties

Figure 23: Portion of the Concrete Structure for Demolition and Rebuild

6.1.3.1 Demolition Work

An approved commercial diving company will have to be appointed for all underwater activities. The structure will be demolished in the following way:

- Remove the old rails;
- Cut the beams; and
- Prepare the piles for construction.

6.1.3.2 Removing of the Old Rails

- Cutting off the nuts and brackets on the old rails;
- The team will use a grinder or an Oxy-arc cutter;
- Remove all brackets and nuts from the area and safely dispose of them;
- Rig the sections of the rails up and remove with a crane truck; and
- The crane truck will place the rails at areas specified in the scope of work.

6.1.3.3 Cutting of the Beams

- The dive team will need to make 264 cuts on the old concrete structure;
- 4 cuts per Centre Longitudinal Beams;
- 4 cuts per Side Longitudinal Beams;
- 8 cuts per Transverse Beams;
- The dive team will be able to do 3.2 cuts a day thus 84 days of cutting;
- The dive team will use hydraulic grinders and a specialized cutting tool to cut through the beams;
- After the cutting is done the cut off sections will be removed from the water and placed in a laydown area specified in the scope of work;
- The beams on the shallow side of the slipway will be dragged out to the key on the western side of the slipway where they will be lifted out of the water; and
- The deep end of the slip's cuts will be lifted by a lifting bag and floated out to the lifting point.

6.1.3.4 Preparation of Existing Piles for Construction of New Beams

- After all the concrete beams have been removed the dive team must break the top of the piles and expose the reinforcement. The depth will be determined by the depth of the new beam that will span over the existing pile;
- The dive team will use a jackhammer to break the pile up and expose the reinforcing; and
- The process of breaking up the pile head is slow and would take about 1 day per pile.

6.1.3.5 Construction

A commercial diving company will have to be appointed for all underwater activities. The following is a list of activities in sequential order:

- The divers will build the formwork box and fix it in place to the specifications. The divers will then inspect after boxing is completed to ensure that it is to the scope of work;
- The divers will then fix the reinforcement to the specifications and inspect afterwards to ensure that it is in accordance with the scope of works;
- A concrete mix design must be submitted to the engineer for approval and must comply with SANS 10100-2;
- Testing of concrete and frequency of sampling must be done in accordance with SANS 1200 G and SANS 10100;
- The concrete shall be placed by means of the TREMIE method by pumping the concrete into the box formwork;
- The divers will use the concrete pump nozzle to fill the box from the bottom up. The diver will cast the concrete and move the nozzle upwards in a slow and steady movement as the box fills with concrete;
- After casting of concrete the divers must inspect the box formwork for deformities; and
- After the concrete has set the divers will remove the box formwork and move it to the next bay.

6.1.4 Replace existing wooden cradle with steel cradle

The new cradle will be completely designed and fabricated from steel, approximately 42m (its original length). The width of the side slip cradles was optimised for the geometry of the site which was found to permit a length of 8.2m, thus allowing vessels up to 5.5m beam. The length of the sideslip cradles was optimised for maximum vessel handling resulting in a total length of 21.04m, splittable into two sections. Each section can handle a vessel allowing two vessels to be accommodated simultaneously on the side slip cradle. The new cradles must be designed with component sections that are easily assembled and dismantled, this requirement being supportive of future cradle maintenance. Pre-impregnated, marine grade bushes are specified for all wheel assemblies to limit maintenance and increase service life.

Refer to **Figure 24** for the Main and Side Slip Cradles Concept Drawing.

The main cradle and side slip cradles will be inclusive of wheel assemblies, wooden chock blocks, rails, sole plates, clips, fixing and securing elements. The cradles will be steel structures, assembled together with forged fabricated wheels similar to gantry crane wheels. The wheels are supported on A65 designation rails designed to suite the wheel profiles, with the rails being supported in turn on stainless steel sole plates that are fixed to the slipway concrete beams. The sole plate and rail assemblies are secured to the concrete beams by a combination of chemical anchors and rail clips. Vessels are mounted onto the cradles using a technique called 'slipping'. The cradles are moved in and out of the water using a winching and sheave wheel arrangement.

The surface of the sideslip will be expanded by approximately 300 square meters.

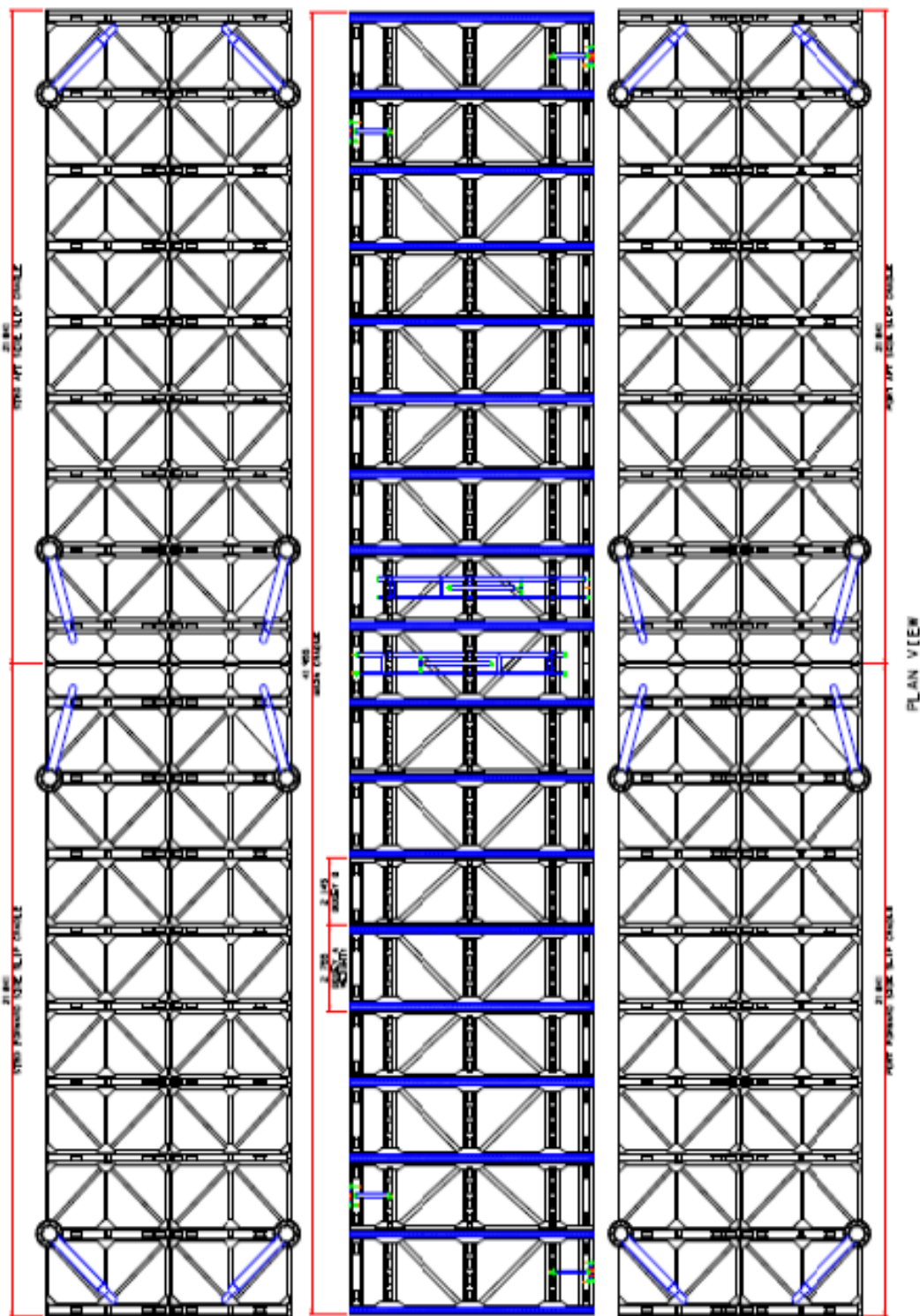


Figure 24: Main and Side Slip Cradles Concept Drawing

The new cradle shall be operated by a single winch which is connected through a large diameter sheave wheel housed on the cradle. The new winch shall have a pulling force of 55 Tons. The overall cradle contains approximately 800 wheels. The new and upgraded slipway

system will offer two side slip cradles and a main centre cradle. The optimal configuration of vessels taking this layout into consideration is presented in **Figure 25**.

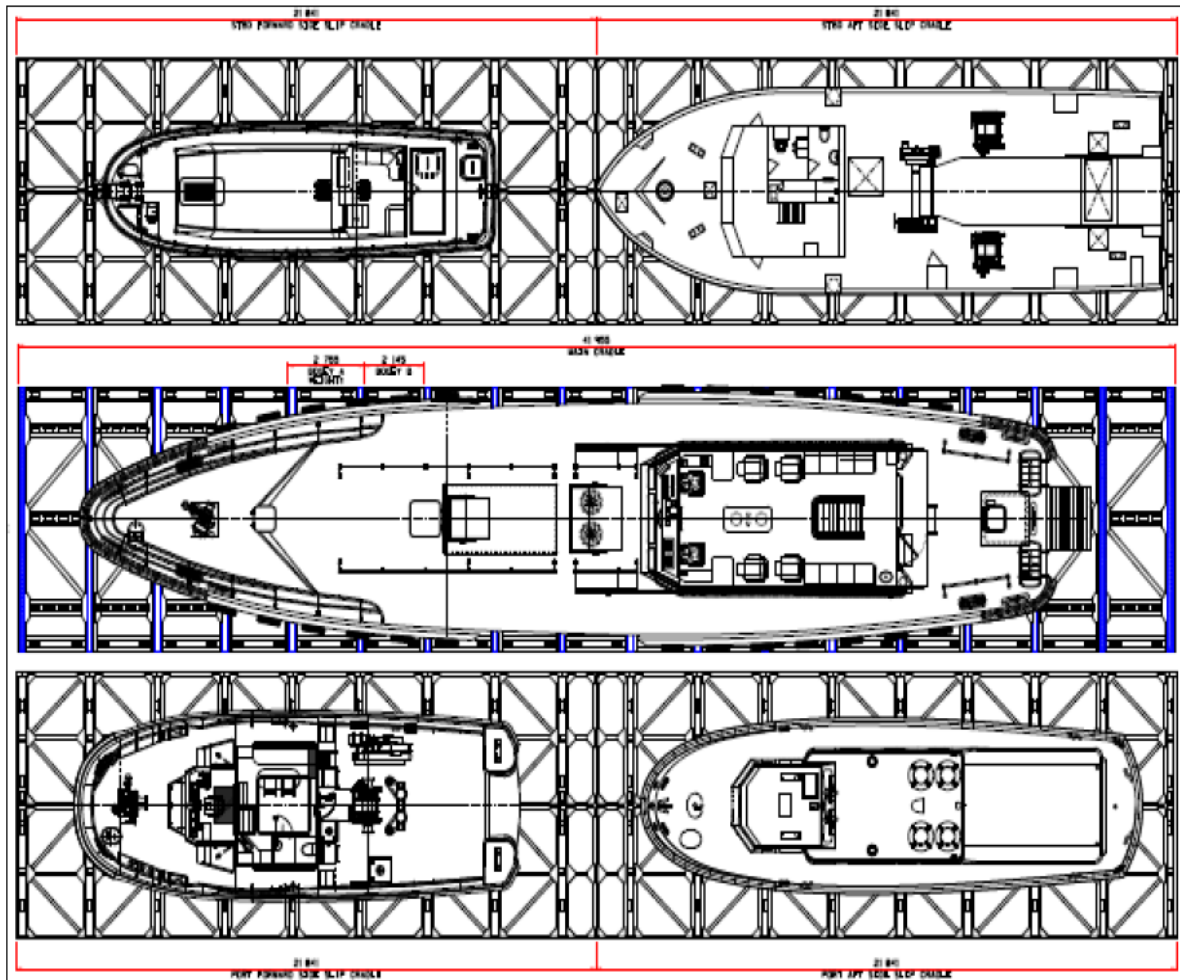


Figure 25: Optimal vessel layout on main and side slips

6.1.5 Demolish and rebuild winch house and associated buildings

Due to the poor condition of the existing winch, it will be replaced with hydraulically driven replacements for both uphaul and downhaul motions (**Figures 26** and **27**). The existing winches have historic significance to the TNPA, the utmost care shall thus be taken by the Contractor when removing the winches. The recovered winches shall be carefully moved to the site laydown area.

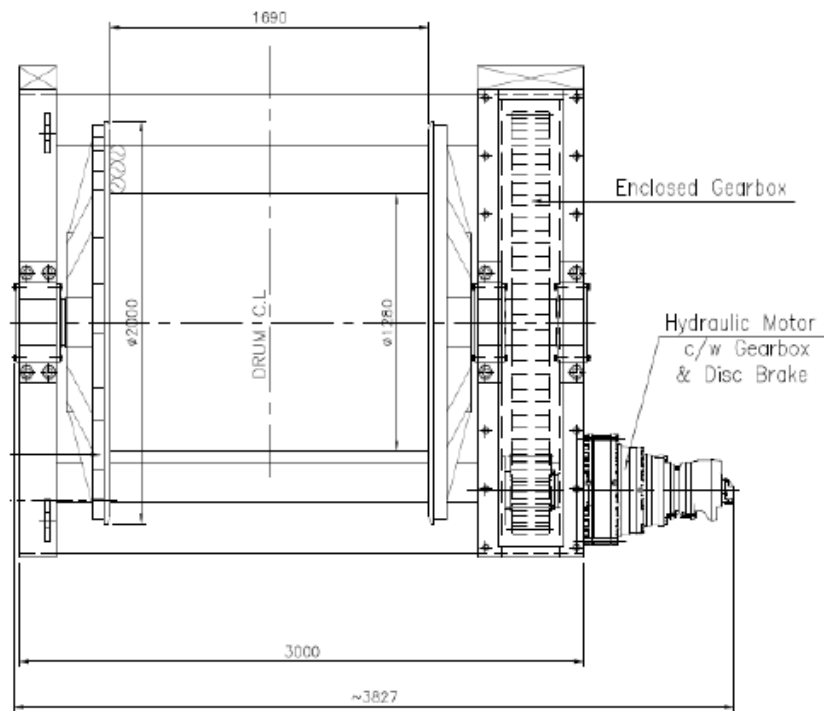


Figure 26: New uphaul winch

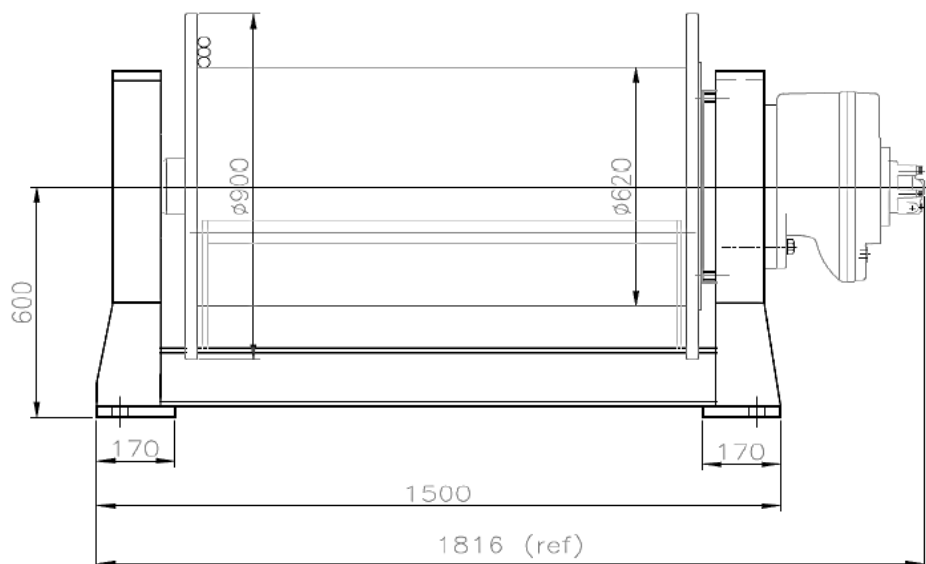


Figure 27: New downhaul winch

Side slipping was not previously practiced at the ship repair facility but will now be reinstated (**Figure 28**), requiring the installation of a new side slip winch to move the new side slip cradles. The winch is hydraulically driven using a hydraulic power pack pumping through a hydraulic motor. The side slip winches are not housed in the existing winch room but outside near the side slip cradles.

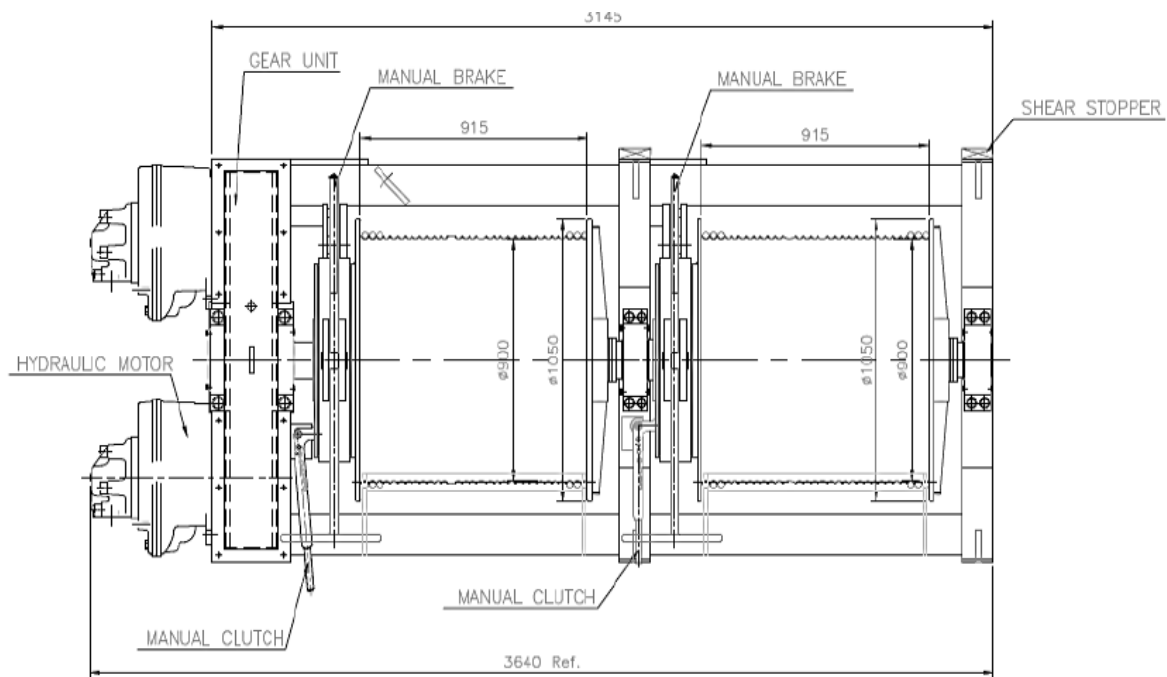


Figure 28: New side slip winch

An operations building was originally constructed at the same time as the slipway. The building was meant to house operations staff and slipway management, provide operations support for ship repairs in the form of a maintenance and fabrication workshop and house the slipway drive. A few years ago, the operations building was modified to temporarily accommodate the Port's management and support staff, while the old administration and port control building was being upgraded. With the near completion of the upgrades to the old administration building, the management staff are expected to move out of the operations building. The building is old, of outdated construction and does not meet the Port's future operational requirements and is targeted for upgrade and modernisation.

A new building for housing the slipway management staff and containing a new workshop and winch house shall be constructed. The existing footprint of the existing building shall not be modified, the new building shall have an identical footprint as the existing building. Refer to **Figure 29** for an example of the proposed operations building.



Figure 29: Floor layouts of operations building

6.1.6 Stormwater management and recycling system

Cleaning of the hull forms are usually undertaken by wet grit blasting and high pressure washing, the intention being to strip off marine growth and old paint applications and to provide the required surface preparation for new corrosion protection applications. The waste materials that are washed off the vessels, currently flow down the slipway and into the port waters. The waste materials are largely comprised of the grit used in the sandblasting process as well as paint flakes and marine growth. These materials contribute to sediment build up in the Port, which in-turn impacts the necessity for increased dredging cycles with associated costs.

TNPA have considered a system for recovering and disposing of most of the waste generated from the cleaning and surface preparation of vessel's steelwork, while on the slipway. The system is also capable of processing stormwater that may ingress into the system. The system comprises the following:

- Settling tank;
- Transfer and recirculation pumps;
- Multi-media sand filter;

- Filtered water, termed “grey water”, storage tank;
- Piping and valves; and
- Removable basket strainer.

Refer to **Appendix 2** for a layout of the proposed system. Water containing grit and paint flakes is accumulated in catchment channels located above the water line on the slipway and toward the water side on the sideslips. The channels are designed with sufficient slope to promote gravimetric flow and are meant to transfer the water to the concrete settling tank. Some grit will settle in the channels before reaching the settling tanks, requiring that the channels themselves be periodically washed down. Stormwater is also expected to enter these channels and as a result will find its way into the settling tanks. The settling tank, located below ground level, will be covered by rectagrid, this enables operators to regularly monitor the tanks volume from the top. Grit settles to the bottom of the tank. The settling tank will be fitted with a suction pipe and has a floor that is sloped to the vicinity of the suction pipe so that when the accumulated sludge from the floor of the tank needs to be removed, a honeysucker can hook-up to the pipe from ground level and suck up the sludge. The separated water in the tank will be pumped through a sand filter, as it is still expected to contain floating particles like paint flakes, into a storage tank. The settling tank pump will be used to reduce the tank volume before the sludge clean-out can proceed. The storage tank will also be fitted with a pump to transfer water back to the work area. The complete installation will be covered by a lean-to roof structure that will assist in reducing stormwater ingress directly into the settling tank. Due to the slipway site layout and also accommodating for future side slipping activities, two identical systems, either side of the slipway main cradle, with 30m³ settling tank capacity will be constructed.

6.1.7 1 MVA Substation

A new substation, located within the Mossel Bay Port boundary, shall replace the Municipality’s Ring Main Unit (RMU) that is fed from the Bland Street substation. Removal of the RMU shall be at the municipality’s cost. The slipway substation shall have new medium voltage switchgear with the following:

- 6 tier, medium voltage power factor correction;
- 1MVA Dry type transformer with copper windings; and
- Low voltage main distribution board.

6.1.8 Upgrade services

The following services require to be upgraded: electrical, sewer, water (salt and fresh), compressed air, lighting, sideslip yards, working area surfacing, and bunding.

6.1.9 Final Site Layout

Taking into consideration all the project components in Sections 6.2 to 6.8, **Figure 30** below shows a diagram of the proposed final layout.

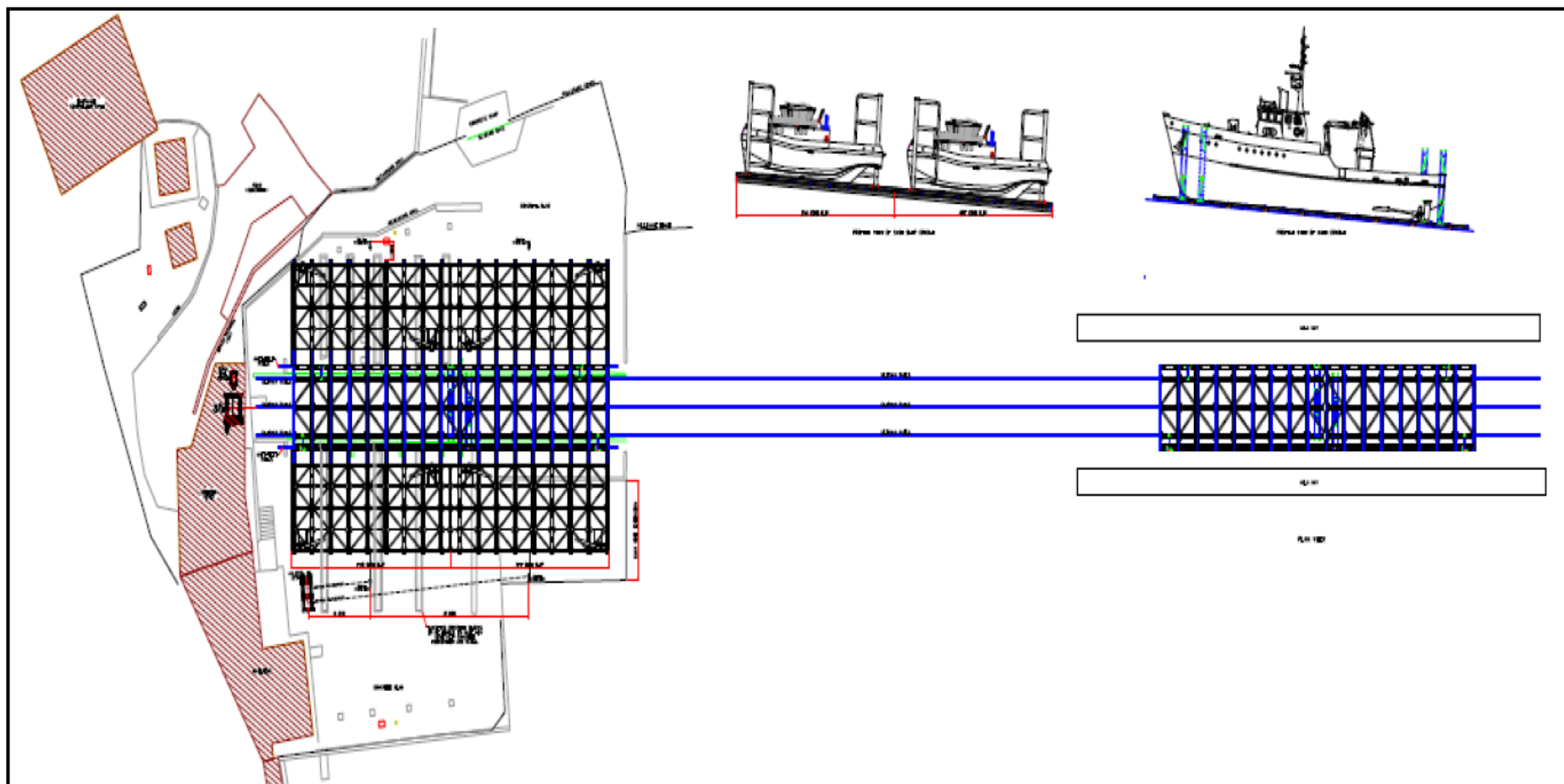


Figure 30: Final Site Layout

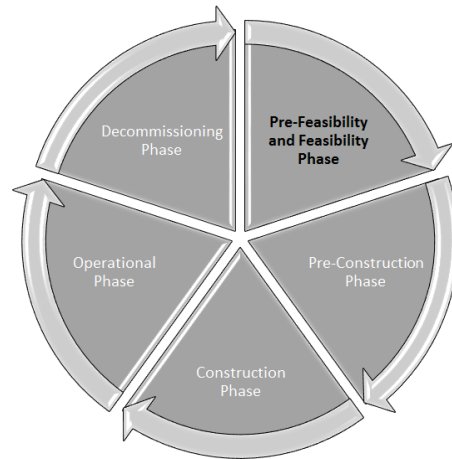
6.2 Project Lifecycle

The project lifecycle for the proposed upgrade of the existing ship repair facility at the port of Mossel Bay includes the following primary activities:

Pre-Feasibility and Feasibility Phase

This includes the following:

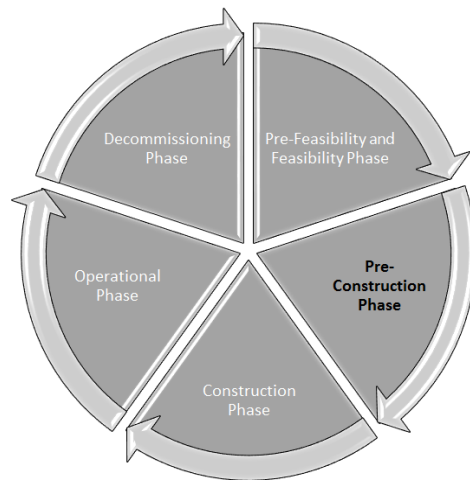
- Evaluate how the ship repair facility could be rehabilitated and modernized back to its original capacity;
- Technical, economic, financial and environmental screening of options;
- Geotechnical investigations;
- Underground services detection survey;
- Topographical site survey; and
- Developing a design layout, which is assessed as part of the BA.



Pre-Construction Phase

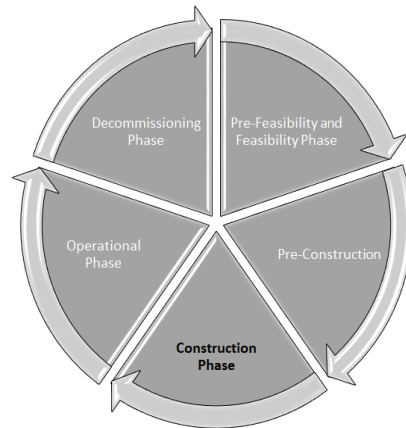
This phase, which is only undertaken should environmental authorisation be obtained, includes the following –

- Detailed engineering design;
- Obtain any heritage permits;
- Obtain Environmental Authorisation;
- Procurement process for Contractors;
- Appoint Environmental Control Officer (ECO);
- Fencing off of construction site;
- Construction employment; and
- Set up site camp.



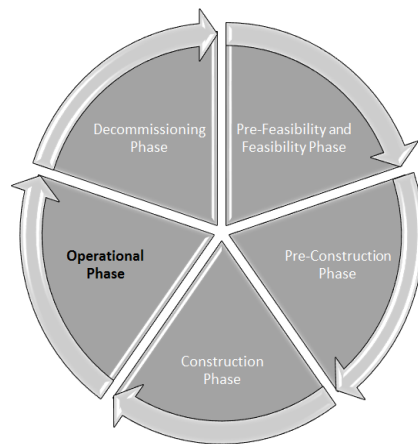
Construction

During the implementation of the project, the construction activities related to the port upgrade is undertaken (as described for each project component in Sections 6.1).



Operation

This includes operational activities associated with the Mossel Bay Port ship repair facility as well as implementation of the water quality monitoring programme.



6.3 Resources Required for Construction

The resources currently used in the operation phase for the ship repair facility within the Mossel Bay will be utilised the same for the operation phase. This section briefly outlines the resources that will be required to execute the construction phase of the project.

6.3.1 Water

During the construction stage, water will be required for various purposes, such as concrete batching, washing of plant and equipment in dedicated areas, potable use by construction workers, etc. There will be no sourcing of water for construction purposes from watercourses. Water tankers will also supply water to the site.

6.3.2 Sanitation

Sanitation services will be required for construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier.

6.3.3 Waste

Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at construction camps) and will be removed at regular intervals and disposed of at approved waste disposal sites within each of the local municipalities that are affected by the project. All the waste disposed of will be recorded.

Construction-related wastewater, which refers to any water adversely affected in quality through construction activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g. equipment, staff); and
- Drainage over contaminated areas (e.g. cement batching / mixing areas, workshop, equipment storage areas).

Suitable measures will be implemented to manage all wastewater generated during the construction period.

6.3.4 Electricity

Electricity will be obtained from diesel generators or temporary electricity connections during the construction phase.

6.3.5 Construction Workers

The appointed Contractor will make use of skilled labour where necessary. In those instances where casual labour is required, TNPA will request that such persons are sourced from local communities as far as possible.

6.3.6 Construction Site Camps

The location of the construction camp will be within the Mossel Bay Port.

7 PROJECT ALTERNATIVES

7.1 Introduction

The 2014 EIA Regulations, as amended (07 April 2017) require that feasible project specific alternatives are identified (including the "do nothing" option). Alternatives are defined as different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity; or

- operational aspects of the activity; and
- the option of not implementing the activity.

The sub-sections to follow discuss the alternatives investigated during the Feasibility Study that led to the selected option to upgrade the ship repair facility. In addition, the alternatives to be assessed in the BA Process are also detailed.

By conducting the comparative analysis, the BPEO can be selected with technical and environmental justification. Münster (2005) defines BPEO as the alternative that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”.

7.2 Alternatives Screened during the Pre-Feasibility Phase

A Pre-Feasibility study report, containing three possible options for adoption by TNPA, was developed:

1. Option 1 – Do-Nothing: This is currently the status quo of the facility and has resulted in significant reputational damage to the TNPA due to vessels based at the Port of Mossel Bay having to sail to other ports for repair and maintenance. The “Do Nothing” option will result in the progressive deterioration of the facility and will result in the decommissioning and demolition of the assets of this facility;
2. Option 2 – Immediate Priority: These options address the immediate need of the Port to provide a safe, functional and modern ship repair facility in the shortest time possible. To achieve this, these options are centred on returning the facility to its original design parameters, either by rehabilitation or reconstruction. These options take cognizance of the significant time delays that may result due to the high-risk possibility that highly contaminated heavy metals are present in the sediments adjacent to the slipway land/sea interface due to years of uncontrolled hazardous waste runoff from the maintenance of vessels.
 - a. Rehabilitate/repair existing civil infrastructure and rehabilitate/repair mechanical and electrical infrastructure to ensure that the existing facility performs to the design level of the 1968 upgrade, i.e. designed to cater for a vessel of with a 500 long ton light displacement tonnage with side slip facility to cater for two simultaneous dry-dockings. Provide new cradle;
 - b. Demolish existing facility and re-construct with facility that performs to the design level of the 1968 upgrade, i.e. designed to cater for a vessel of with a 500 long ton light displacement tonnage with side slip facility to cater for two simultaneous dry-dockings. Provide new cradle;
3. Option 3 – Future Expansion: These options are developed to provide high level guidance in regard to the potential expansion possibility available, should the TNPA perceive an increase in ship repair opportunities at the Port of Mossel Bay. These

options take cognizance of the current and future vessels that are either using the port as a base or are within the waters surrounding the port.

- a. Replace the existing slipway with a vertical lift system, using a shiplift or syncrolift© with a capacity of 1500 long tons combined with transfer area catering for five 40m LOA vessels; and
- b. Replace the existing slipway with a vertical lift system, using a floating dock with a lifting capacity of 1500 long tons specialized for end transfer of vessels with displacement of 700 long tons and transfer area catering for five 40m LOA vessels.

In order to ensure no delay in the project due to the urgency, the Immediate Priority Category was developed, with Option 1 being the Rehabilitation Option and Option 2 being the Demolish and Replacement Option.

7.3 Alternatives Assessed as part of the BA Process

7.3.1 Preferred Alternative 1

Repair existing slipway (the underwater portion of the rail support beams for the cradle will be rebuilt, above water portions will be repaired): Repair the existing concrete beam structures above and below water and replace all rails and fixing elements.

7.3.2 Alternative 2

Complete demolition and replacement of slipway (above and under water): Demolish the existing underwater concrete beam superstructure inclusive of the portion within the tidal zone, by cutting the structure at the pile support level and rebuild the entire structure making use of concrete precast elements wherever possible. Repair the beam structures above water, due to their seemingly better condition than below water structure. Replace all rails and fixing elements.

7.4 No-go Alternative

The 'no-go' alternative refers to a situation where the ship repair facility is not upgraded. This would mean that vessels based at the Port of Mossel Bay will have to continue to sail to other ports for repair and maintenance. Not only is this costly for fisherman but it will continue to have significant reputational damage to the TNPA. The progressive deterioration of the facility will result in the decommissioning and demolition of the assets of this facility as it is currently unsafe and cannot be utilised.

8 LEGISLATION AND GUIDELINES CONSIDERED

8.1 Overview of Legislation

Some of the pertinent environmental legislation that has bearing on the proposed development is captured in **Table 4** below. More detailed information is provided in **Section 8.2 to 8.19**. This section aims to satisfy 3(1)(e) of Appendix 1 of GN No. R. 982: A description of the policy and legislative context within which the development is proposed including:

- i) 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 preparation of the report; and
- ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments.

Table 4: Environmental legislative framework

Legislation	Relevance
Constitution of the Republic of South Africa (Act No. 108 of 1996)	Chapter 2 – Bill of Rights. Section 24 – environmental rights.
National Environmental Management Act (Act No. 107 of 1998)	Section 24 – EA (control of activities which may have a detrimental effect on the environment). Section 28 – Duty of care and remediation of environmental damage. Environmental management principles. Authority – DEA.
GN No. R. 982 of 04 December 2014 EIA Regulations	Process for undertaking Basic Assessment / Scoping and EIA Process.
GNs No. R. 983 and 984 of 04 December 2014 EIA Regulations	Activities that need to be assessed through a Basic Assessment Process.
GN No. R. 985 of 04 December 2014 EIA Regulations	Activities that need to be assessed through a Scoping and EIA Process.
National Water Act (Act No. 36 of 1998)	Chapter 3 – Protection of water resources. Section 19 – Prevention and remedying effects of pollution. Section 20 – Control of emergency incidents. Chapter 4 – Water use. Authority – DWS.
National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)	Process for a Coastal Waters Discharge Permit (CWDP). Process for a Dumping at Sea Permit (DSP) Authority – DEA.
South African Maritime Safety Authority (SAMSA) (1998)	To provide for the establishment and functions of the South African Maritime Safety Authority; and to provide for incidental matters.
Marine Living Resources Act (Act No. 18 of 1989)	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

Legislation	Relevance
	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.
Sea birds and Seals Act (Act No. 46 of 1973)	Provides protection for various seabirds along the South African coast.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes. Authority – DEA.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Management and conservation of the country's biodiversity. Protection of species and ecosystems. Authority – DEA.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Air quality management. Section 29 – pollution prevention plans (Notice 172 of 2014: Greenhouse gases as priority air pollutants) Section 32 – dust control. Section 34 – noise control. Section 35 – control of offensive odours. Authority – DEA.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Chapter 4 – Waste management measures Chapter 5 – licensing requirements for listed waste activities. Authority – DEA.
Occupational Health & Safety Act (Act No. 85 of 1993)	Provisions for Occupational Health & Safety. Major Hazardous Installation Regulations. Authority – Department of Labour.
National Heritage Resources Act (Act No. 25 of 1999)	Section 34 – protection of structure older than 60 years. Section 35 – protection of heritage resources. Section 36 – protection of graves and burial grounds. Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m ² in extent. Authority – Heritage Western Cape and the South African Heritage Resources Agency (SAHRA).
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Control measures for erosion. Control measures for alien and invasive plant species. Authority – Department of Agriculture, Forestry and Fisheries (DAFF).
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	Permit required for borrow pits. Authority – Department of Mineral Resources (DMR).
National Ports Act (Act No. 12 of 2005)	The Act 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.

8.2 Constitution of the Republic of South Africa (Act No. 108 of 1996)

The Constitution of the Republic of South Africa (Act No. 108 of 1996) is the supreme law of the land and provides amongst others the legal framework 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 –

to an environment which is not harmful to their health or wellbeing;

to have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:

Prevent pollution and ecological degradation;

Promotes conservation;

Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development”

The Constitution provides the overarching framework for sustainable development.

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

The proposed upgrade of the ship repair facility at the Mossel Bay Port requires authorisation in terms of NEMA, and the BA will be undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017).

Important aspects of NEMA are sustainability principles such as the “Polluter Pays” and the “Precautionary Principle” which will also be taken into account in the assessment of the impacts of the proposed development.

8.3.1 2014 EIA Regulations, as amended (07 April 2017)

The EIA Regulations 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 proposed upgrade of the ship repair facility at the Mossel Bay Port triggered activities under Listing Notices 1 and 3, and thus needs to be subjected to a BA Process. The Listed Activities are explained in the context of the project in **Table 5**.

Table 5: Listed activities triggered by the proposed project

GN No. R.	Activity	Description as per GN	Applicability to the Project
GN R. 983 of 04 December 2014 (as amended)	19A(iii)	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—</p> <p>(i) the seashore;</p> <p>(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or</p> <p>(iii) the sea; —</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(f) will occur behind a development setback;</p> <p>(g) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(h) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>The project involves:</p> <ul style="list-style-type: none"> ➤ Demolishing the existing wooden lead-in jetties; ➤ Installing Docking Arms; ➤ Repairing existing slipway (the underwater portion of the rail support beams for the cradle will be rebuilt, above water portions will be repaired); ➤ The surface of the sideslip will be expanded by approximately 300 square meters; and ➤ Replacing the existing wooden cradle with a steel cradle. <p>The above components will involve dredging, excavation, removal and moving soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres in total.</p>
GN R. 983 of 04 December 2014 (as amended)	31(i and ii)	<p>The decommissioning of existing facilities, structures or infrastructure for—</p> <p>(i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;</p>	<p>The existing lead-in jetties will be demolished.</p>

GN No. R.	Activity	Description as per GN	Applicability to the Project
		<p>(ii) any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;</p> <p>(iii) ...</p> <p>(iv) any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or</p> <p>(v) any activity regardless the time the activity was commenced with, where such activity:</p> <p>(a) is similarly listed to an activity in (i) or (ii) above; and</p> <p>(b) is still in operation or development is still in progress;</p> <p>excluding where—</p> <p>(aa) activity 22 of this notice applies; or</p> <p>(bb) the decommissioning is covered by part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies.</p>	
GN R. 983 of 04 December 2014 (as amended)	52	The expansion of structures in the coastal public property where the development footprint will be increased by more than 50 square metres, excluding such expansions within existing ports or harbours where there will be no increase in the development footprint of the port or harbour and excluding activities listed in activity 23 in Listing Notice 3 of 2014, in which case that activity applies.	The proposed development footprint is at least 13 000m ² within the coastal public property.
GN R. 983 of 04 December 2014 (as amended)	55(i)(a)	Expansion- (i) in the sea;	<p>The project requires the following:</p> <ul style="list-style-type: none"> • Installation of docking arms to be mounted onto the new steel cradle. The side slip cradles

GN No. R.	Activity	Description as per GN	Applicability to the Project
		<p>(ii) in an estuary; (iii) within the littoral active zone; (iv) in front of a development setback; or (v) if no development setback exists, within a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever is the greater; in respect of-</p> <p>(a) facilities associated with the arrival and departure of vessels and the handling of cargo; (b) piers; (c) inter- and sub-tidal structures for entrapment of sand; (d) breakwater structures; (e) coastal marinas; (f) coastal harbours or ports; (g) tunnels; or (h) underwater channels; but excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	<p>will be fitted with 80ft, vertically mounted frame structures called docking arms;</p> <ul style="list-style-type: none"> Repairing the existing slipway (the underwater portion of the rail support beams for the cradle will be rebuilt, above water portions will be repaired); The surface of the sideslip will be expanded by approximately 300 square meters; and Replacing existing wooden cradle with steel cradle.
GN R. 985 of 04 December 2014 (as amended)	10(i)(iii)(aa)	<p>The development of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>(i) In Western Cape: i. Areas zoned for use as public open space or equivalent zoning;</p>	<p>A stormwater management and recycling system will be required. Water containing grit and paint flakes will enter this system. The design load of the system is estimated at 60m³. Due to the slipway site layout and also accommodating for future side slipping activities, two identical systems, each</p>

GN No. R.	Activity	Description as per GN	Applicability to the Project
		<p>ii. All areas outside urban areas; or</p> <p>iii. Inside urban areas:</p> <p>(aa) Areas seawards of the development setback line or within 200 metres from the high-water mark of the sea if no such development setback line is determined;</p> <p>(bb) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; or</p> <p>(cc) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.</p>	<p>having a 30m³ settling tank capacity, will be required on either side of the slipway main cradle.</p> <p>The proposed facility occurs within the urban edge and within 200m of the high-water mark of the sea.</p>

8.4 National Water Act (Act No. 36 of 1998)

The National Water Act (Act No. 36 of 1998) (NWA) regulates water resources of South Africa. Water is considered a scarce commodity and should therefore be adequately protected. Amongst others, 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 NWA includes the definition of a Water Resource.

The NWA definition for a Water Resource includes:

1. A Watercourse;
2. Surface Water;
3. An Estuary; and
4. An Aquifer.

The NWA defines a watercourse as follows:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse include, where relevant, its bed and banks.

The Act also specifies that a wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil. Section 21 of the NWA provides information on what water uses require approval, i.e. a Water Use License (WUL).

These include:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity;
- e) Engaging in a controlled activity;
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;

- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

Based on the fact that an estuary is defined as a 'water resource' and not a 'watercourse', a Water Use License Application (WULA) in terms of the NWA is not necessary as there are no activities requiring this. Further, the prevention and remedying of the effects of pollution as contemplated under Section 19 of the NWA will be taken into account in the project design and the Environmental Management Programme (EMPr). Thus, none of the abovementioned water uses apply to the proposed upgrade of the ship repair facility at the Mossel Bay Port.

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

The National Environmental Management: Integrated Coastal Management Act (NEM:ICMA) (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 justifiable and ecologically sustainable.

Another important definition is that of Coastal Public Property (Section 7 of the Act):

"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 mentioned in paragraphs (a) to (h) that is owned by an organ of state.”*

It also 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.

Section 69 of the NEM:ICMA deals with the discharge of effluent into coastal waters, under Chapter 8: Marine and Coastal Pollution Control. Prior to the NEM:ICMA coming into effect, the disposal of land-derived effluent into coastal waters through pipelines was controlled and regulated by the Department of Water Affairs under the NWA. However, with NEM:ICMA now in place, these regulations are now under the mandate of the DEA Directorate: Oceans and Coasts. The NEM:ICMA makes provision for the permitting for the discharge of any waste water into the South African coastal waters.

No discharge of effluent is anticipated for this project and thus no Coastal Waters Discharge Permit (CWDP) applies.

Section 70 of the NEM:ICMA deals with the prohibition of incineration or dumping at sea while Section 71 deals with Dumping Permits. Dumping at sea is only permitted for certain substances and this is governed by Section 71 (3). A Dumping at Sea Permit (DSP) can be obtained for dredged material if certain conditions are satisfied. Specifically, for dredged material and sewerage sludge, the goal of waste management should be to identify and control the sources of contamination. The latest Dumping at Sea Regulations (21 July 2017) detail the process for an application of a DSP in terms of Section 71(1).

No offshore disposal of dredge material is anticipated for this project and thus no DSP applies.

8.6 South African Maritime Safety Authority (SAMSA) (1998)

The South African Maritime Safety Authority (SAMSA) was established in terms of SAMSA Act, 1998 ("the Act") as a juristic person. Its objectives are—

- (a) to ensure safety of life and property at sea;
- (b) to prevent and combat pollution of the marine environment by ships; and
- (c) to promote the Republic's maritime interests.

8.7 Marine Living Resources Act (Act No. 18 of 1989)

The Marine Living Resources Act (MLRA) (Act No. 18 of 1989) 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 ascertained. The MLRA applies to all persons on, or in South African waters.

The main implication of this act is the sustainable utilisation of marine resources. Due to the project being located in the intertidal and subtidal zone of the harbour, a Marine Environment Impact Assessment was undertaken (**Appendix 6A**).

8.8 Sea birds and Seals Act (Act No. 46 of 1973)

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

The main implication of this act is the protection of seabirds.

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

The aim of the National Environmental Management: Protected Areas Act (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.

Mossel Bay is not a protected area however as a natural resource, it is necessary to ensure the use of Mossel Bay is sustainable.

8.10 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act (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.

The main implication of this act is the protection of biodiversity. The Port of Mossel Bay is a built-up environment and contains no Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) and thus no impacts on terrestrial ecosystems is expected. However, a Marine Environment Impact Assessment was undertaken to assess the impacts on marine biodiversity, refer to **Appendix 6A** for the study.

8.11 National Environmental Management: Air Quality Act (Act No. 39 of 2004)

The National Environmental Management: Air Quality Act (Act No. 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 measures for the control of dust, noise and offensive odours that may be relevant to the construction. No Air Emissions License will be required for the proposed development; however, the potential impacts on air quality will be discussed in Section 18.

8.12 National Environmental Management Waste Act (Act No. 59 of 2008)

The National Environmental Management Waste Act (Act No. 59 of 2008) (NEM:WA) 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.

The latest list of waste management activities that have or are likely to have a detrimental effect (GN No. 921 of 29 November 2013) contains activities listed in Categories A and B that would require licensing from the provincial or national authorities and activities contained in Category C which would require meeting the requirements of various Norms and Standards.

No authorisation will be required in terms of the NEM:WA, as the project will not include any of the listed waste management activities.

8.13 Occupational Health & Safety Act (Act No. 85 of 1993)

The Occupational Health and Safety Act (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.

TNPA will be required to meet the requirements of the OHS Act during the upgrade of the ship repair facility.

8.14 National Heritage Resources Act (Act No. 25 of 1999)

The National Heritage Resources Act (NHRA) (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 categories as listed below require a Heritage Impact Assessment. These categories are:

(a) the construction of a road, wall, power line, 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 50m in length;

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

(i) exceeding 5 000 m² in extent; or

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

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the rezoning of a site exceeding 10 000 m² in extent; or

any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The NHRA protects both buildings and shipwrecks that are older than 60 years old.

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

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

Due to the footprint within the Port of Mossel Bay, a Phase 1 Heritage Impact Assessment (**Appendix 6B**) has been undertaken. The findings of the Specialist Study are summarised in Section 16. In addition, the EMPr provides mitigation measures should any significant maritime archaeology sites be discovered during construction.

8.15 Conservation of Agricultural Resources Act (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA) requires the maintenance of riparian vegetation and provides a list of invasive alien vegetation that must be controlled or eradicated.

Control of invasive vegetation will be discussed in the EMPr.

8.16 Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)

The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) sets out the requirements with which applicants for prospecting rights, mining rights and mining permits must comply in Sections 16, 22 and 27 of the MPRDA.

A Mining Permit will not be required as there will be no dredging of material.

8.17 National Ports Act (Act No. 12 of 2005)

The National Ports Act (NPA) (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.

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.

Section 80 of the NPA deals with Port regulations, while Section 83 deals with Port Access and recognises that a port must be freely accessible to any person who conducts lawful business in it. However as per the requirements of the International Ship and Port Facility

Security (ISPS) code and the Occupational Health and Safety Act, a balance between public access and safety is required.

As per Section 80 (2) of the NPA, TNPA has developed Port Rules (Government Gazette No 31986 on 6 March 2009) for the control and management of ports and the approaches thereto and for the maintenance of safety, security and good order in the ports. The Port Rules deal with the following:

- Vessel movements;
- Health and Safety;
- Prevention of Pollution;
- Protection of the Environment; and
- Compliance with the Port Waste Management Plan.

TNPA is required by the NPA to promote economic development of the Port. Further, a balance between environmental protection and economic development must be achieved.

8.18 Guidelines

- Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a);
- Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b);
- Integrated Environmental Management Guideline Series 5: Companion to the EIA Regulations 2010 (DEA, 2010a);
- Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010b);
- Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005);
- Port Rules GG No. 31986 (Vol. 525) 6 March 2009;
- South African Water Quality Guidelines for Coastal Marine Waters (Natural Environment; DWAF, 1995); and
- International Convention on the Control of Harmful Anti-fouling Systems (HAFS) on Ships (the HAFS Convention), 5 October 2001.

8.19 Regional Plans

The following regional plans were considered during the execution of the EIA (amongst others):

- Mossel Bay Spatial Development Framework (SDF);
- Mossel Bay Integrated Development Plan (IDP); and

- Relevant provincial, district and local policies, strategies, plans and programmes.

9 BASIC ASSESSMENT PROCESS

9.1 2014 EIA Listed Activities (as amended)

The proposed upgrade of the ship repair facility at the Mossel Bay Port entails certain activities that require authorisation in terms of NEMA. Refer to Section 8 for a further discussion on the legal framework.

The process for seeking authorisation is undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017), promulgated in terms of Chapter 5 of NEMA.

Based on the types of activities involved, which include activities listed in GN No. R. 983 and R. 985 (see **Table 5**), the requisite environmental assessment for the project is a BA Process.

9.2 Competent Authority

In terms of the Regulations, the lead decision-making authority for the BA Process is DEA, as the project proponent is TNPA, which is a state-owned entity.

9.3 Formal Process

An outline of the BA Process for the proposed upgrade of the ship repair facility at the Mossel Bay Port is provided in **Figure 31**.

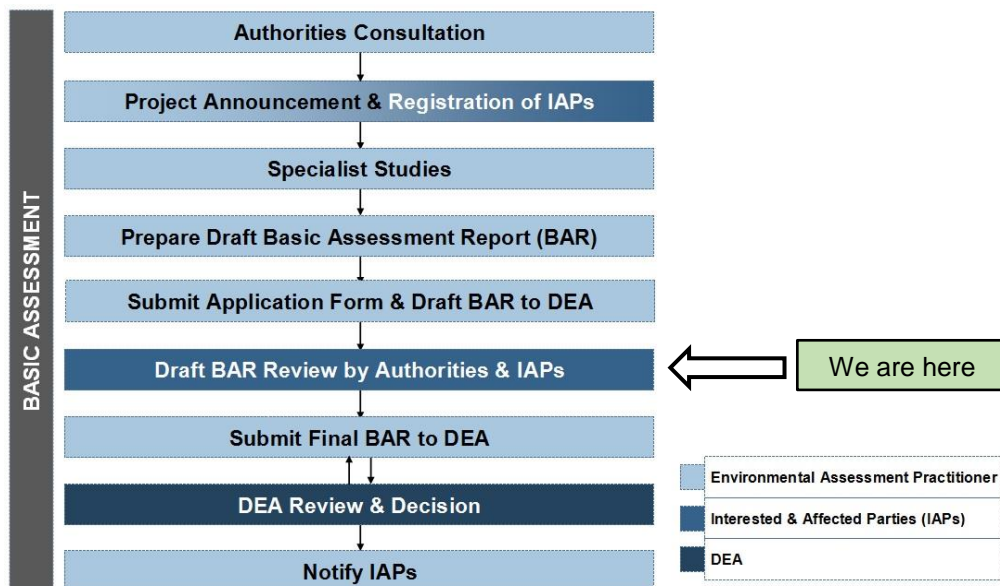


Figure 31: BA Process

9.4 Landowner Consent and Notification

According to Regulation 39(1) of GN No. R 982 of the 2014 EIA Regulations (as amended), if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.

This requirement does not apply *inter alia* for linear developments (e.g. pipelines, power lines, roads) or if it is a Strategic Integrated Project (SIP) as contemplated in the Infrastructure Development Act (2014).

For the purposes of this project, TNPA is both the Applicant and the Landowner and thus landowner consent is not required.

9.5 Application Form

An Application Form, in terms of Regulation 16 of Government Notice No. R. 982 of the 2014 EIA Regulations (as amended), will be submitted to DEA together with the Draft BAR. Refer to **Appendix 4** for a copy.

9.6 Public Participation and Review of BAR

The Draft BAR will be made available to IAPs for a 30-Day Review Period from 15 October 2018 to 13 November 2018. All comments received will be taken into account in the Final BAR and will also be included in the Comments and Response Report.

More detail on the Public Participation Process is provided in **Section 14**.

10 ASSUMPTIONS AND LIMITATIONS

The following assumptions were made during the BA Process:

- The detailed engineering design will be finalised at a later stage. The conditions of the EA, if issued, must be factored into the final design;
- As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the infrastructure may change during the detailed design phase;
- The findings of the Impact Assessment are informed by the Specialist reports which are assumed to be accurate; and
- The mitigation measures provided in the EMPr will be implemented and it assumed that the measures are adequate and will successfully enhance positive impacts while limit the negative impacts.

11 NEED AND DESIRABILITY

In terms of 3(1)(f) of Appendix 1 of GN No. R. 982 of the amended 2014 EIA Regulations (07 April 2017), this section discusses the need and desirability of the project. The format contained in the Guideline on Need and Desirability (DEA&DP, 2009) has been used in **Table 6**.

Table 6: 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).	<p>Yes.</p> <p>The Mossel Bay IDP (2018/2019) mentions the development need/priority for the Harbour and Waterfront Development by the Mossel Bay Municipality and TNPA. One of the special focus areas in the IDP for the expected performance outcome for 2022 includes the urban renewal strategy including the Central Business District (CBD) and Point upgrading / harbour development. The IDP aims to improve utilisation of the harbour as an economic driver and tourism attraction. The IDP includes the proposed Harbour Development Precinct. The 2017 Mossel Bay SDF states that repurposing of the Historic CBD into a Tourist Node will redevelop the harbour as Port and Waterfront. The SDF recommends investigating movement in the historic CBD to create a tourist friendly environment. And optimise historic CBD potential via optimising existing underutilised land and buildings for tourist activities.</p> <p>The proposed upgrade of the ship repair facility falls within the existing Mossel Bay Port.</p> <p>Therefore, the proposed development is in line with the current IDP and SDF.</p>
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?	<p>Yes.</p> <p>As described in the IDP, the current deterioration of the port may have negative impacts on the tourism of the area and on TNPA therefore the proposed development will act as an economic driver and tourism attraction. Vessels based at Mossel Bay are also continuously having to travel to other ship repair facilities as they cannot utilise the current facility due to it being unsafe. This has cost and time implications for fisherman.</p>

No.	Question	Response
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)	Yes. The strategic need for the project is discussed in Section 4.3. Vessels based at Mossel Bay are continuously having to travel to other ship repair facilities as they cannot utilise the current facility due to it being unsafe. This has cost and time implications for fisherman.
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?	The existing Port of Mossel Bay has current capacity of services however the proposed upgrade entails upgrading services. All relevant applications will be submitted to the Mossel Bay Municipality.
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)?	The proposed development is supported by the Mossel Bay Municipality and is included in the IDP as part of improving the harbour and waterfront.
6.	Is this project part of a national programme to address an issue of national concern or importance?	One of the primary drivers for the proposed development are based on the National Government initiative called Operation Phakisa which is linked to the National Development Plan. Not only will the proposed upgrade fall under the Operation Phakisa Initiative, but it also introduces other features, like side slipping, which would serve the following purposes: <ul style="list-style-type: none"> • Increase the facilities' utilisation; • Increase revenue generation for TNPA; • Modernize the facility; and • Increase the safety at the site.
DESIRABILITY ('placing')		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	The proposed upgrade is of the existing Mossel Bay Port. Two alternative methods for the upgrade are considered for the project (Section 7.3). Option 1 was selected. Reasons are provided in Section 19.
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and Spatial Development Framework (SDF) as agreed to by the relevant authorities?	No. As discussed in Item No. 1, the proposed development is in line with the current IDP and SDF.
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?	Currently, there is no existing EMF for Mossel Bay. This application will not compromise the integrity of environmental management priorities in the area as the project involves

No.	Question	Response
		<p>upgrading the harbour development proposed in the IDP and SDF.</p> <p>A number of mitigation measures have also been provided by all specialists and these have been incorporated into the EMPr contained in Appendix 7.</p>
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).	<p>The proposed development does not change the land use of the existing Mossel Bay Port.</p> <p>Therefore, the land use is favoured.</p>
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)?	Refer to Section 18 for an assessment of the project's potential impacts.
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)?	
13.	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	There will be no unacceptable opportunity costs.
14.	Will the proposed land use result in unacceptable cumulative impacts?	There will be no change in land use for the proposed development. However, cumulative impacts are discussed in Section 18.10.

12 TIMEFRAMES

In terms of 3(1)(q) of Appendix 1 of GN No. R. 982 of the amended 2014 EIA Regulations (07 April 2017), this section discusses the period for which the EA is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised. These proposed timeframes are provided in **Table 7**.

Table 7: Timeframes

Requirement	Proposed Timeframe
Environmental Authorisation (EA)	2019
Pre-Construction	TBC
Construction	TBC
Operation	TBC

The project is currently in its feasibility phase. The timeframes are confirmed after the design phase and when the project is in execution phase. These timeframes are usually determined after EA is obtained.

13 FINANCIAL PROVISIONS

In terms of 3(1)(s) of Appendix 1 of GN No. R. 982 of the amended 2014 EIA Regulations (07 April 2017), this section discusses details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.

Due to the sensitive nature of financial provisions, TNPA cannot detail the exact amounts but can confirm that there is sufficient amount of finances to ensure the project can be completed.

14 PUBLIC PARTICIPATION PROCESS

14.1 General

The purpose of the public participation process for the proposed development includes:

- Providing IAPs with an opportunity to obtain information about the project;
- Allowing IAPs to express their views, issues and concerns with regard to the project;
- Granting IAPs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the project; and
- Enabling the project team to incorporate the needs, concerns and recommendations of IAPs into the project, where feasible.

The public participation process that was followed for the proposed project is governed by NEMA and GN No. R. 982 of the 2014 EIA Regulations, as amended. Details of the process are provided below. All Public Participation material can be referred to in **Appendix 5**.

14.2 Pre-Application Consultation

A Pre-Application Consultation Meeting was held with DEA on 20 March 2017 (refer to **Appendix 5D** for a copy of the minutes of the meeting). The purpose of the meeting included the following:

- To provide an overview of the project to DEA;
- To present the approach to the BA Process; and
- To determine DEA's requirements.

14.3 Landowner Notification

For the purposes of this project, TNPA is both the Applicant and the Landowner and thus landowner notification is not required.

14.4 Project Announcement – Initial IAP Registration Period

Nemai Consulting commenced with initial public notification in August 2017 in which adjacent landowners/occupiers, key regulatory authorities, stakeholders and the public were informed about the proposed project.

14.4.1 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:

- Adjacent landowners to the site;
- Stakeholders that may not be directly affected by the project but may be interested in the development;
- Marine, Conservation, Heritage, Recreation, Fisherman and Local Organisations that may have an interest in the project;
- Businesses and Rate Payer's Associations in the surrounding areas;
- Organs of State that may have an interest in the project; and
- Key Organs of State/Authorities that will comment on the BAR, including:
 - DEA: Oceans & Coasts
 - Western Cape (WC) Department of Environmental Affairs and Development Planning (DEA&DP)
 - DWS: WC Region
 - DAFF: WC Region
 - WC Provincial Heritage Resources Authority
 - SAHRA
 - Eden District Municipality
 - Mossel Bay Local Municipality, including the Ward Councillor

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

14.4.2 Initial IAP Registration

The notification process undertaken is detailed in the sections to follow:

14.4.2.1 Background Information Document (BID)

BIDs, 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.

Project announcement took place in August 2017. Proof of initial notification is provided in **Appendix 5B**. All reply forms and comments from registered IAPs to date are included in **Appendix 5C**.

14.4.2.2 Site Notices

Seven site notices were placed at strategic points around the Port of Mossel Bay (**Table 8**).

Table 8: Locations of site notices

No.	Coordinates	Description
1	34°10'52.20"S; 22°08'51.35"E	Mossel Bay Port Gate 2 Bland Street Entrance
2	34°10'51.56"S; 22°08'51.49"E	Site Boundary of the existing Ship Repair Facility
3	34°10'52.89"S; 22°08'52.24"E	The Goods Shed Flea Market
4	34°10'53.85"S; 22°08'53.04"E	Corner of Mitchell Street and Bland Street
5	34°10'41.57"S; 22°08'37.46"E	Port of Mossel Bay Gate 1 Church Street
6	34°10'47.11"S; 22°09'5.39"E	Port of Mossel Bay Gate 3 Kloof Street
7	34°10'54.75"S; 22°08'22.34"E	Mossel Bay Local Municipality Town Hall

Proof of site notices are provided in **Appendix 5B**. Notification of the proposed development and how to register as an IAP were provided on the site notice.

14.4.2.3 Newspaper Notice

An advert was placed in the George Herald (in English) published on 10 August 2017 and an advert was also placed in the Mossel Bay Advertiser (in Afrikaans) published on 11 August 2017. These notices provided information on the proposed development and details on how to register as an IAP. A copy of the newspaper notices is provided in **Appendix 5B**.

14.4.2.4 Authority Meeting

An Authorities Meeting was held on 24 August 2017 at the Mossel Bay Town Hall. Refer to **Appendix 5D** for a copy of the minutes.

14.4.2.5 Focus Group Meeting

A Heritage Focus Group Meeting was held on 24 August 2017 at the Mossel Bay Town Hall. Refer to **Appendix 5D** for a copy of the minutes.

14.4.2.6 Public Meeting

A Public Meeting was held on 24 August 2017 at the Mossel Bay Town Hall. Refer to **Appendix 5D** for a copy of the minutes.

14.4.2.7 Update of IAP Database

The IAP Database was updated throughout the registration period.

14.5 Review Process for the Draft BAR

14.5.1 30-Day Public Review Period

In accordance with GN No. R. 982 of the amended 2014 EIA Regulations (07 April 2017), IAPs were granted an opportunity to review and comment on the Draft BAR. A hardcopy of the document was placed at the Mossel Bay Town Hall, details provided in **Table 9**. A link to the electronic copy was also available. Emails were sent to all registered IAPs to notify them of

the review period of the Draft BAR. The 30-Day public review period will take place from **15 October 2018 to 13 November 2018**.

Table 9: Location of Draft BAR for Review

Venue	Address	Contact Details
Mossel Bay Town Hall	101 Marsh Street, Mossel Bay	044 606 5112

14.5.2 30-Day Authority Review Period

Copies of the Draft BAR were also provided to the key regulatory and commenting authorities mentioned in Section 14.4.1.

Proof of notification to commenting authorities of the review period and all proof of deliveries of the Draft BAR to all organs of states will be available in the Final BAR.

14.5.3 Notification of Draft BAR review period

BIDs, which included a Reply Form, were distributed again via email to IAPs as well as previously registered IAPs contained in the IAP Database. BIDs contained the details of the Draft BAR review period and meetings.

Seven site notices were placed again at the locations in **Table 8**.

Adverts were placed again in the George Herald (in English) and the Mossel Bay Advertiser (in Afrikaans).

Notification took place in October 2018. Proof of notification will be provided in the Final BAR.

14.5.4 Authorities Meeting

An Authorities Meeting will be held again to discuss the findings of the BAR on 29 October 2018. The minutes and attendance registers of the meeting will be provided in the Final BAR.

14.5.5 Focus Group Meeting

A Focus Group Meeting will be held again with the Heritage Mossel Bay to discuss the findings of the Heritage Impact Assessment on 29 October 2018. The minutes and attendance registers of the meeting will be provided in the Final BAR.

14.5.6 Public Meeting

A Public Meeting will be held again to discuss the findings of the BAR on 29 October 2018. The minutes and attendance registers of the meeting will be provided in the Final BAR.

14.6 Comments and Responses Report

The CRR, which summarises the salient issues raised by IAPs and the project team's response to these matters, is contained in **Appendix 5E**. The issues listed in the CRR were

identified from completed Reply Forms, emails, and other correspondence received to date. The CRR will be updated in the Final BAR, after the 30-day review period.

14.7 Decision on the Final BAR

The Final BAR will be submitted to DEA after the 30-Day review period reflecting the incorporation of comments received. The EAP will inform all registered IAPs of the decision on the Final BAR by DEA, of which DEA have 107 days to make a decision from the receipt of the Final BAR.

15 ENVIRONMENTAL ATTRIBUTES

The environmental attributes associated with the proposed upgrade of the ship repair facility include the geographical, physical, biological, social, economic and cultural aspects of the environment. The following significant environmental attributes are focused on in this report:

1. Geology and Soil;
2. Marine Environment;
3. Socio – Economic Environment;
4. Air Quality;
5. Noise;
6. Historical and Cultural Features;
7. Transportation;
8. Aesthetic Qualities; and
9. Existing Infrastructure.

15.1 Geology and Soil

According to the 3322 Duidtshoorn 1:250 000 Geological Series below, the site is underlain by Tertiary and Quaternary sand underlain by Peninsula Formation whitish weathering quartz sandstone of the Table Mountain Group in the Cape Supergroup (**Figure 32**). A Geotechnical Specialist, iLZ Consulting, was appointed to undertake a complete geotechnical investigation, underground services detection survey and topographical site survey for the proposed upgrades to the Port of Mossel Bay Ship Repair Facility for TNPA. The geotechnical investigation included drilling of boreholes at predetermined locations around the slipway site.

The investigation carried out on site indicated the site to be underlain by transported material in a form of alternating sequences of sand and quartzitic sandstone boulders and pebbles. Although foundation loads were not available at the time of preparation of this report, field investigation indicated that the site is suitable for the proposed development.

The soils underneath the Operations Building are classified as C1 with modifies normal foundations placed at 0.6 to 0.9mbgl as recommended founding solution if current foundations are to be changed. On the other hand, the crane in the operations building workshop should be constructed on reinforced pad footings founded on improved soil stabilized with cement for an estimated safe allowable bearing pressure of 120kPa.

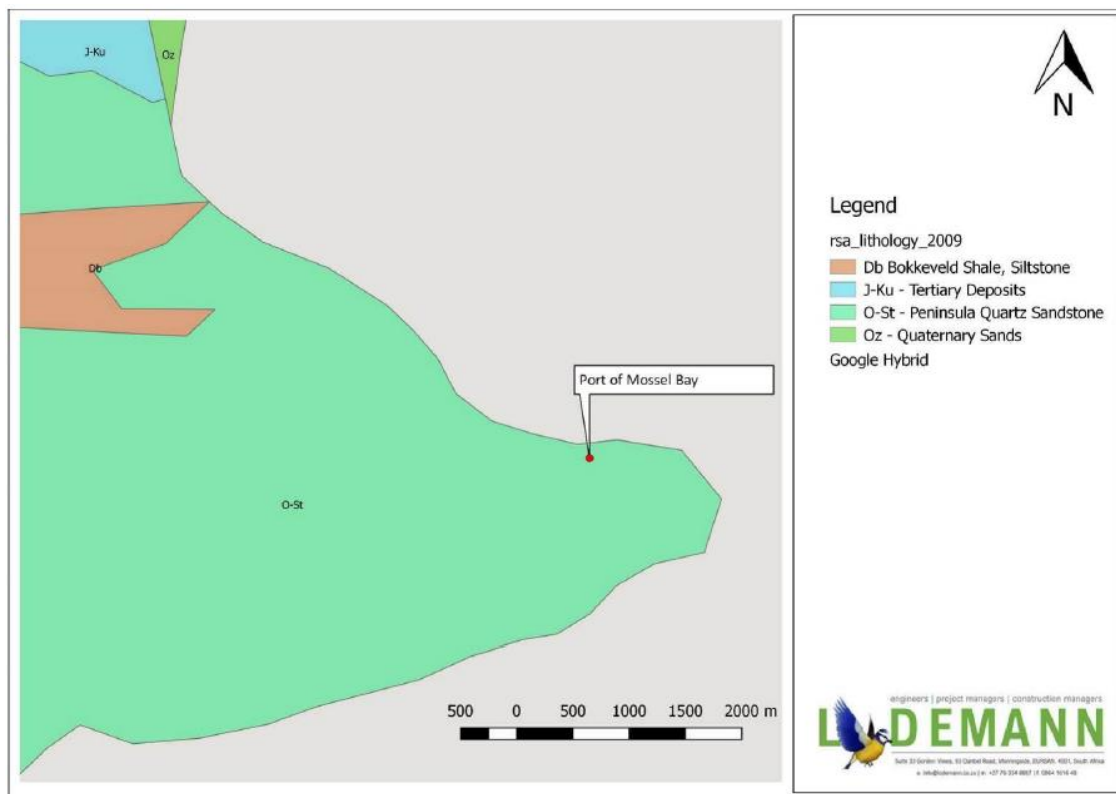


Figure 32: Geological Map at 1:250 000

Although no competent bedrock was encountered in any of the boreholes, Rotapiles have been recommended as a piling solution under the prevailing geotechnical conditions. These piles should be founded at a depth of 20m (below ground level or below sea bed).

In terms of the lead-in jetties, the geotechnical desktop study concluded that bedrock material would likely be encountered at shallow depths of around 3 meters. This is one of the reasons for why docking arms have been proposed instead of rebuilding the lead-in jetties.

15.2 Marine Environment

15.2.1 Climate

Mossel Bay's climate is mild throughout the year as the town is situated in the area where the winter rainfall and all-year rainfall regions of the Western Cape Province meet. The climate in

Mossel Bay is influenced by the Agulhas Current of the Indian Ocean, and by the presence of the Outeniqua Mountains to the north.

The warmest month of the year is January, with an average temperature of 21.1°C and mean daily max of 27°C (**Figure 33**). Monthly average rainfall in Mossel Bay does not show any particular seasonal pattern, and ranges from a minimum of 16mm in January (summer) and June (winter) to 40mm in October (spring) and 32mm in April (autumn) and November (summer) (**Figure 33**).

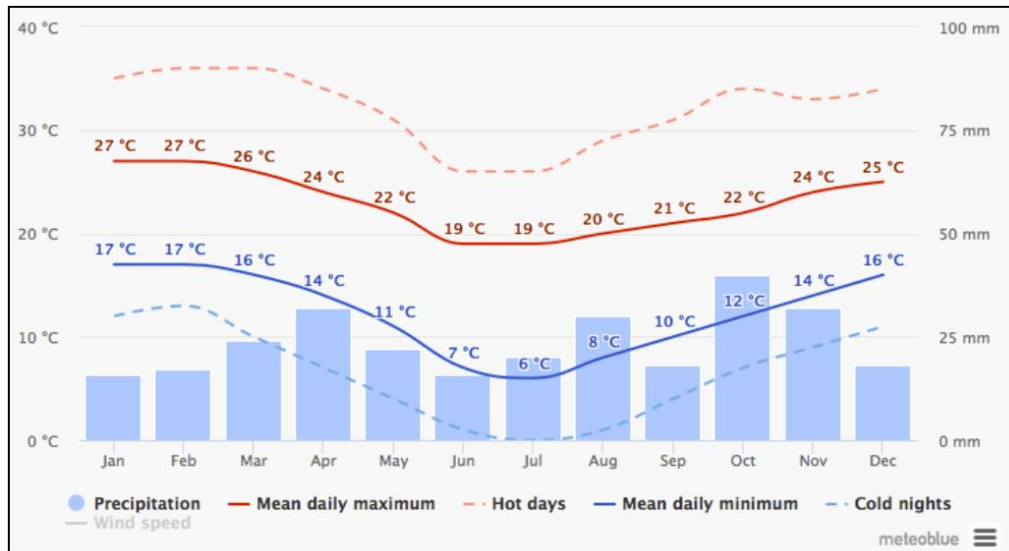


Figure 33: Average temperature and rainfall for Mossel Bay
(https://www.meteoblue.com/en/weather/forecast/modelclimate/mossel-bay_south-africa_973709)

The wind rose for Mossel Bay shows how many hours per year the wind blows from the indicated direction (**Figure 34**).

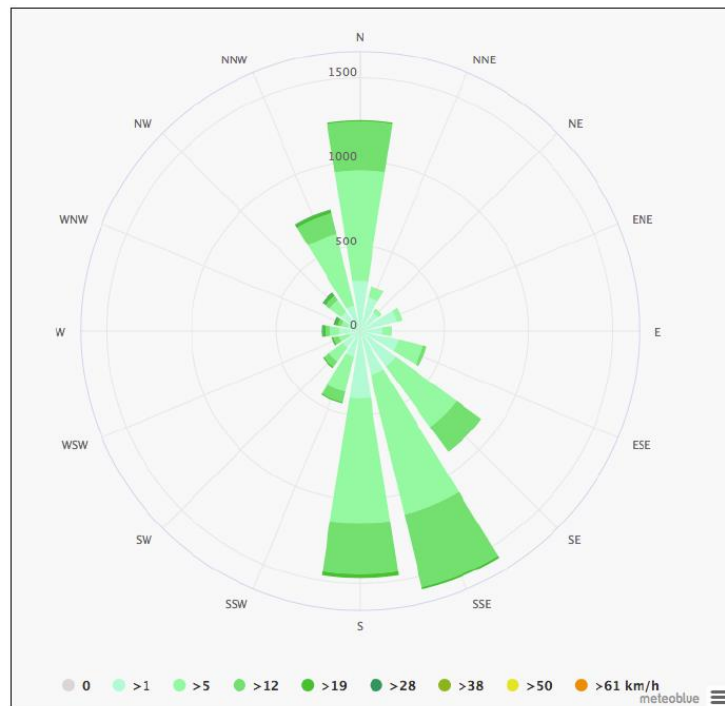


Figure 34: Wind Rose for Mossel Bay
(https://www.meteoblue.com/en/weather/forecast/modelclimate/mossel-bay_south-africa_973709)

15.2.2 Bathymetry

The bathymetry in the bay area around the port is relatively shallow with the 20m depth contour between 1.2 to 2.8km offshore (**Figure 35**). The depths in the port range from 8m at the entrance channel, 6.5m at quay 4, and 5.5m at the slipway (**Table 10, Figure 36**). The maximum permissible draught inside the harbour is 6.5m.

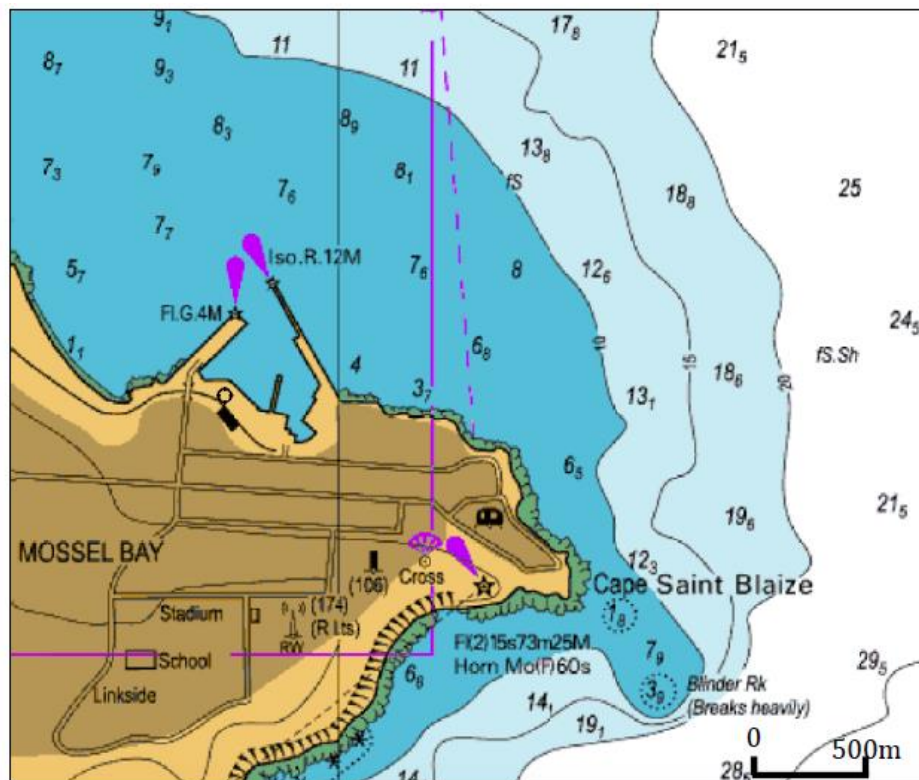


Figure 35: Marine Chart in bay area around Mossel Bay Port (ZA 4154_1)

Table 10: Mossel Bay Port quay facilities (Source: www.transnetnationalportsauthority.net)

Facility	Length	Depth	Craneage	Cargoes/usage
Quay 4	274 m	6.5 m	-	Oil industry
Quay 5	170 m	3.5 m	-	Fish and related products
Vincent Jetty	2 x 143 m	3.5 – 5.5 m	-	Fish and general dockings
No. 1 Low lev	6.2 m	1.2 m	-	General dockings and fish
Quay 1	43 m	1.2 m	-	General dockings and fish
Quay 2	53 m	2.2 m	-	Fish industry
Quay 3	213 m	5.0 m	-	-
Slipway	-	5.5 m	-	-
CBM	-	12 m	-	Oil industry
SPM	-	13 m	-	Oil industry



Figure 36: Berth layout and depths within the Port of Mossel Bay (Source: Adapted from TNPA National Ports Plan 2017)

15.2.3 Oceanography

The oceanography of South Africa's south coast is strongly influenced by the warm Agulhas Current, which deflects away from the coast at Port Elizabeth (360km North East of Mossel Bay), as a result of the divergence between the shelf edge (and Agulhas Current) and the coast (**Figure 37**).

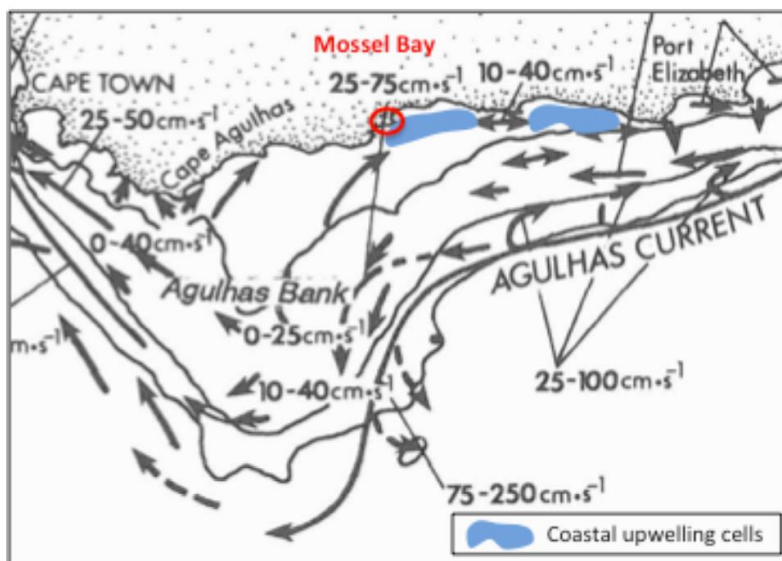


Figure 37: Oceanography in the Mossel Bay coastal zone (Source: Adapted from Hutchings et al. 1995 and Roberts, 2014)

15.2.4 Water quality

TNPA has implemented a Long-Term Ecological Monitoring Programme for the Port of Mossel Bay that is being undertaken by the Council for Scientific and Industrial Research (CSIR). A suite of physical, chemical and biological variables that are widely used as indicators of water quality were measured in situ and in surface water samples collected at six stations in the Port of Mossel Bay (**Figure 38**). These data can be used as a baseline for the Ship Repair Facility upgrade project.



Figure 38: Stations where water quality was monitored. Yellow = in situ measurements and surface water samples; Blue symbols = in situ measurements only (Source: CSIR 2018)

15.2.5 Sediments

The sediment sampled in the Port of Mossel Bay in August 2017 was texturally variable with sediment at Stations 3 and 5 being muddy-sand and as sand at other stations. The ‘muddiest’ sediment was at Station 3 (30.1%) at the point where Quay 2 meets Quay 3 and Station 5 (27.2%) in the middle of the port. The higher contribution of mud at these stations suggests these are the most sheltered parts of the port from a hydrodynamic perspective.

The low contribution of mud sized material to the bulk weight of sediment in the Port of Mossel Bay makes it the only port in South Africa where sediment across the port is dominated by sand. This reflects the fact that there is no significant source of mud sized material to the port apart possibly from stormwater runoff.

15.2.6 Intertidal and subtidal zone

The Port of Mossel Bay is a typical rocky and beach (**Figure 39**). The intertidal rocky shore is that area between the spring low and spring high tides. The south coast zonation is divided into Littorina zone (upper shore), named after the small snails that inhabit this zone (*Littorina* spp.). Below this zone is the Upper Balanoid zone dominated by barnacles (*Balanus* spp.), algae (*Ulva*, *Splachnidium*), winkles (*Oxystele variegata*), and limpet (*Patella granularis*). The Lower Balanoid supports thick beds of algae (e.g. *Gigartina pristoides*), limpet (*Patella longicosta*), winkles (*Oxystele sinensis* and *O.tigrina*), and mussels (*Mytilus*, *Perna*). The south coast has the Cochlear Zone as it is dominated by the limpet *Patella cochlear* that have a fringe of algal garden around each limpet. The Infratidal zone is at the low tide mark and supports red bait (*Pyura stolonifer*), algal spp. (corallines, *Plocadium*, *Bifurcaria*), and urchins (*Parechinus angulosus*).



Figure 39: Mixed rocky/beach area inside the port, next to the ship repair facility

The intertidal zone at the study site in the Port has some of the species mentioned above such as winkles, limpets, black mussels and barnacles (**Figure 40a**), although it does appear to be degraded in some parts such as the rocks to the left of the slipway which are covered in a dark green/black algae and no other typical rocky shore organisms (**Figure 40b&c**).



Figure 40: The intertidal zone in the study area by the ship repair facility. a – just to the right of the slipway; b – to the left of the slipway; c – to the left of the slipway close-up.

Some black mussels (*Mytilus galloprovincialis*), an invasive species, were seen in the study area. This mussel species is present throughout the harbour and is used in the long term monitoring study to determine if metals and polycyclic aromatic hydrocarbons were present in the water column in a bioavailable form. The concentrations of most metals in mussels in the Port of Mossel Bay in August 2017 were broadly comparable to concentrations in mussels in other South African ports, except for arsenic, mercury and zinc. The concentrations of these three metals in the mussels in Mossel Bay Port was by far the highest for any port but the source is uncertain. The subtidal zone is characterised by marine growth (sea anemones, barnacles) on the existing lead in jetties concrete piles and slipway.

15.2.7 Benthic macrofauna

The benthic macrofauna sampled in the Port of Mossel Bay in August 2017 represents a limited array of taxa typical of benthic macrofaunal communities in marine embayments on the south coast of South Africa¹⁰. Benthic macrofauna abundance varied widely, being very low at Station 1 in the innermost part of the port between the Slipway and Quay 1 (43 individuals.m⁻²) to 15 769 individuals.m⁻² at Station 7 alongside Quay 4 (**Figure 41**).

Nematode worms were the most dominant group, comprising about 59% of all benthic macrofauna sample, followed by annelid worms (35%). At Station 1 only annelida and bivalvia were recorded, and at Station 2 by the slipway nematodes were very abundant (**Figure 41**). The high abundance of nematode worms at Station 2 suggests a pollution impact.

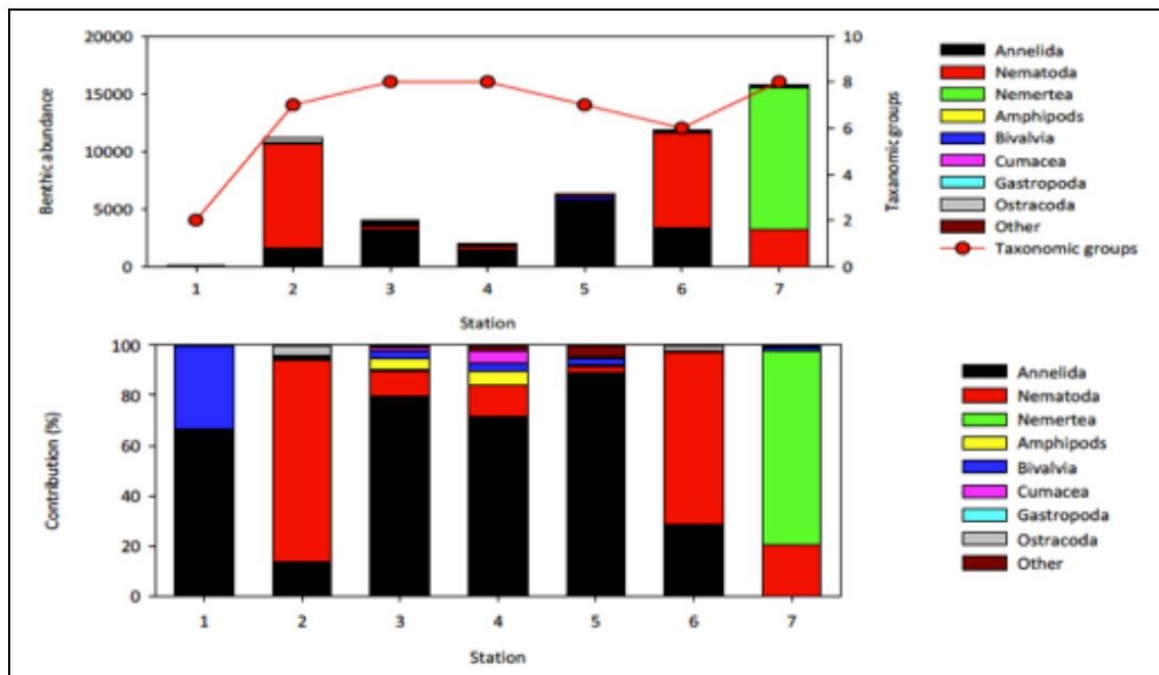


Figure 41: Abundance and number (top) and contribution (bottom) of taxonomic groups comprising the benthic macrofaunal community in the Port of Mossel Bay (Aug 2017) (Source: CSIR 2018)

The status of each station in terms of benthic macrofaunal community index is moderately disturbed at the two stations (1 and 2) by the ship repair facility (**Figure 42**).



Figure 42: Benthic macrofaunal community index in Mossel Bay Harbour Aug 2017 (Source: CSIR 2018)

15.2.8 Ichthyofauna

There are no published data available on the fish population in the harbour itself to provide a baseline so general information on the ichthyofauna is based on research along the study area coastline. In Hartenbos Estuary (8km North West of Mossel Bay Port), estuarine dependent marine fish species such as mullet spp. (*Mugilidae*), estuarine round herring (*Gilchristella aestuaria*) and cape silverside (*Atherina breviceps*) dominated catches. White steenbras (*Lithognathus lithognathus*), Knysna sand goby (e.g. *Psammogobius knysnaensis*), and grunter (*Pomadasys commersonnii*) were also present in small numbers.

Taxa recorded by Bickerton (1982) included *Diplodus capensis*, *Lichia amia*, *Monodactylus falciformis*, *Solea turbynei*, *L. lithognathus*, *G. aestuaria*, *L. dumerili*, *L. richardsonii*, *M. cephalus*, *P.knysnaensis*, *Rhabdosargus holubi* and *Galeichthys feliceps*. *Argyrosomus japonicas* and *Oreochromis mossambicus* have been recorded by anglers in this estuary. This brings the total number of species recorded in the Hartenbos Estuary to 16. Although the port of Mossel Bay is not an estuary, it is likely that some of the marine fish species mentioned above (e.g. *Diplodus capensis*, *Lichia amia*, mullet spp.) are present as juveniles in the harbour of Mossel Bay since embayments can function as nursery areas. A goby was seen in the shallows by the slipway (Figure 43).



Figure 43: Goby in shallows by slipway of Mossel Bay Port and presence of sea anemones

15.2.9 Avifauna

The shoreline, which is subject to tidal action, sustains a variety of intertidal waders (shorebirds) such as sandpipers, terns, gulls, plovers, oystercatchers and gannets.

15.2.10 Phytoplankton and zooplankton

Eutrophication in coastal waters results from excessive nutrient input into the marine environment that results in increased phytoplankton/algal growth. Evidence of eutrophication

is seen by the algal growth in the intertidal zone by the slipway. The concentration of most nutrients in surface water in the Port of Mossel Bay in the winter survey was low, except ammonia concentration, which was relatively high at Station 1 (**Figure 44**). There is a strong likelihood this was from fish processing factory discharges.

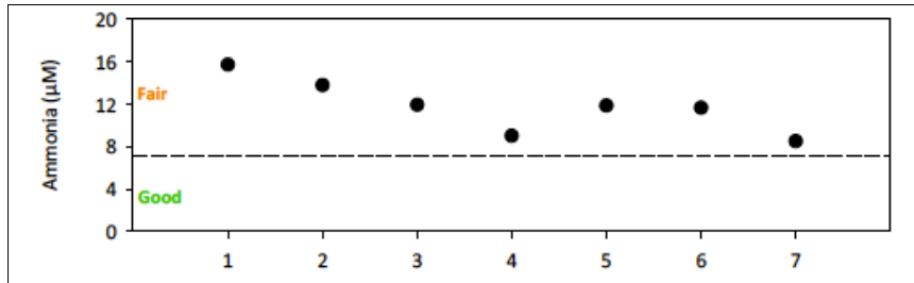


Figure 44: Ammonia levels in Port of Mossel Bay Aug 2017 (Source: CSIR, 2018)

There are no specific data for zooplankton in the harbour itself but studies have been undertaken on the central Agulhas Bank in the Mossel Bay area. Copepods, comprise 90% of zooplankton carbon on the Agulhas Bank, and a single, large (~3 mm) species of copepod, *Calanus agulhensis*, dominates this copepod community in terms of biomass¹⁶. This area has shown a dramatic long-term decline in biomass of total copepods and *C. agulhensis*, as well as in the proportion of *C. agulhensis*, resulting in a gradual shift towards a smaller copepod-dominated community (**Figure 45**).

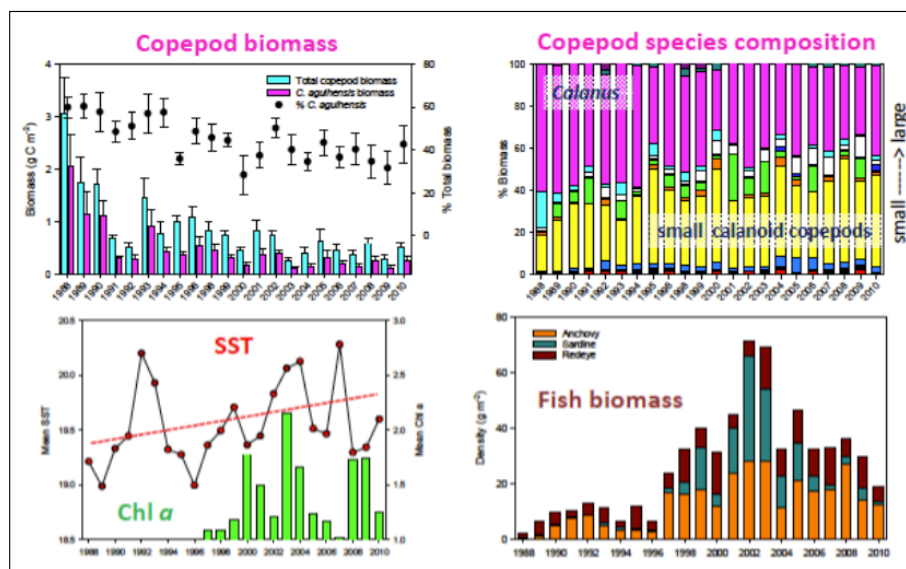


Figure 45: Long-term change in copepod biomass on the central Agulhas (Mossel Bay area) (Source: Huggett et al. 2012)

15.3 Socio – Economic Environment

The Port of Mossel Bay is the smallest commercial harbour in the South African system. It caters for the developing oil industry which began with Mossgas in the late 1980's as well as small but significant fishing industry in the region.

Currently, the ship repair facility is not being used by fisherman as the facility is unsafe. Fisherman have to travel to other Ports in order to repair their vessels, and this is causing a loss of money as they cannot use the facility and instead have to travel much further distances to repair their ships. There is currently a vessel on the cradle (**Figure 46**) that has been abandoned as the ship repair facility is non-operational.



Figure 46: Current vessel on the cradle

15.4 Air Quality

Current air pollution sources in the region include the following:

- Activities within the Port;
- Vessels within the Port; and
- Vehicle tailpipe emissions

15.5 Noise

Noise in the region emanates primarily from Port operations and vehicles on the surrounding road network.

15.6 Historical and Cultural Features

The Development of the Port of Mossel Bay

Mossel Bay can trace its maritime history back 1488, when on 3rd February of that year the Portuguese explorer, Bartholomeu Dias made landfall in the Munro Bay after rounding the Cape of Good Hope. Dias' small fleet put into what he named Aguada de São Bras for water and supplies, and in so doing became the first Europeans to set foot on South African soil (Axelson 1987).

In the following centuries mariners of all nationalities plying the route to and from the East used Mossel Bay, one of the few natural harbours on southern Africa's rugged coast, as a place of refuge where water could be found, supplies replenished and vessels repaired (Scheffler 1990). In 1734 the Dutch governor of the Cape, Jan de la Fontaine, visited Mossel Bay and erected a possession stone, although the first permanent structure - the VOC's granary, which today houses the Bartholomeu Dias Museum - was only built in 1787 (**Figure 47**).



Figure 47: Detail of a VOC map of Mossel Bay dated 1789 (Source: VOC Atlas)

Mossel Bay's role as the port for the southern Cape and Little Karoo began in 1788 with the first shipment from the bay of wheat grown in the area (https://en.wikipedia.org/wiki/Mossel_Bay). Until the mid-nineteenth century, however, harbour facilities were non-existent and vessels using Mossel Bay simply anchored in either Munro or Varkens Bay in the lee of Cape St Blaize (**Figure 47**). According to Scheffler (1990), the first moves to develop harbour infrastructure took place in 1843 when local businessman, Henry Ralph Harris was given colonial government approval to erect a jetty in Varkens Bay. Although there is some question as to whether Harris' jetty was built, he was one of those instrumental in having a Board of Commissioners for Improving the Port and Harbour of

Mossel Bay appointed in 1848. In 1854 the local shipping and landing agent, Daniel Bland, paid for and built a small stone wharf on the eastern side of Varkens Bay. The jetty was lengthened in 1858 and taken over and operated by the government in 1860 (Scheffler 1990).

The opening of Meiringspoort and the access to the Little Karoo and interior this allowed meant that Bland's jetty was soon too small for the increased maritime traffic visiting Mossel Bay and in July 1862 G.W. Pilkington started construction on a second, larger jetty – 122m long and 15m wide - at the end of Bland Street to the west (**Figure 48**). A harbour office was built the same year and in 1874 a stone-built Customs House, the Queen's Warehouse, was erected behind the harbour office (**Figure 49**). In 1884 the jetty was lengthened again and a new loading gantry, visible in **Figure 48** below, was installed (Scheffler 1990).

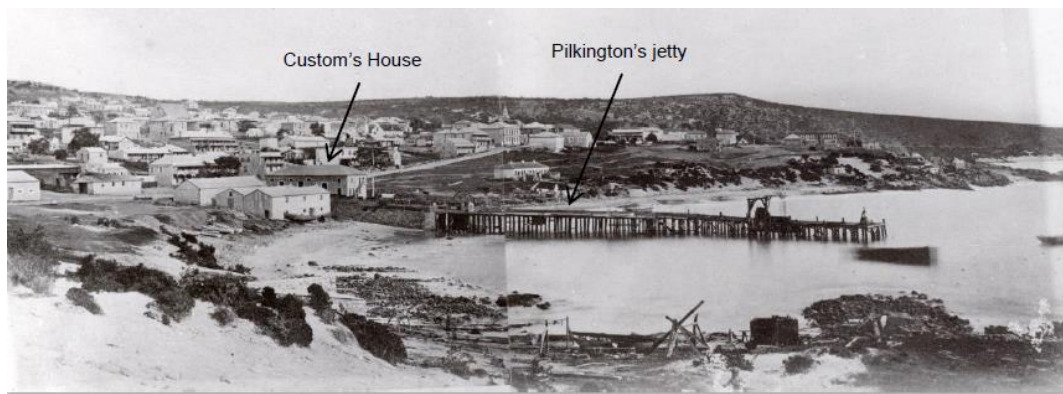


Figure 48: Pilkington's jetty c.1886. Bland's earlier jetty is off the photo to the right (Source: Cape Archive, AG 16352.4 and AG 16352.5)



Figure 49: Pilkington's jetty (c. 1880 and 1882) with the Custom's House and white-painted single-storey Harbour Office (with signal mast) both on the left (Source: Cape Archive, J2802)

In 1895 a seawall was constructed between Pilkington's jetty and a slipway belonging to Henry Harris on the far side of Varkens Bay, adjacent to Bland's jetty. The area behind the new wall

was filled in and provided additional wharfage space for the harbour (**Figure 50**). The buildings associated with the ship repair facility that is the subject of this report would later be constructed on this landfill.

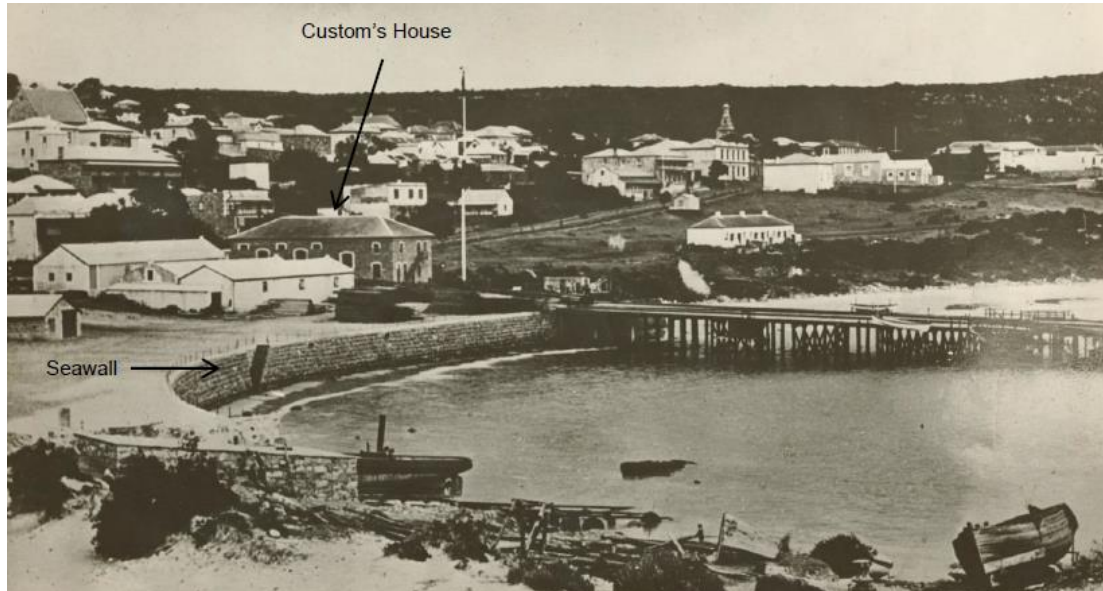


Figure 50: Mossel Bay harbour c. 1895-97 showing the newly constructed seawall between Harris' slipway where the steam launch is hauled out in the foreground and Pilkington's jetty. The buildings associated with the ship repair facility would later be constructed

Between 1898 and 1902 the seaward side of the harbour was enclosed by the construction of a substantial stone breakwater parallel to the shoreline, which was initially proposed by harbour engineer John Coode in 1883 (Scheffler 1990). Coode proposed a breakwater "starting from the isolated rock forming the south-eastern portion of Vaark Bay ... so as to afford protection to the Jetty, and enable landing and shipping to be carried out at all times and also to protect the only anchorage for the cargo boats which at present are moored in Vaark Bay, to the south of the Jetty" (PWD 2/5/277, Cape Archive). During the same period (1901) the storerooms shown on Plate 3 above to the left of the Customs House were demolished and replaced by the large stone packing shed which still stands outside the harbour gate.

To cope with increased activity in the harbour, Pilkington's wood and stone jetty was replaced by the current No.1 or White Jetty below the Customs House and visible on Plate 4 shortly before World War I (Du Plessis 1976).

The Development of the Ship Repair Facility

These developments together boosted the use of Mossel Bay harbour, giving impetus to the growth of the local fishing fleet and fleet of lighters which served the bigger vessels that anchored in the Bay, and providing safe berths for small coasting vessels within the port. This in turn created a need for the slipway which forms the heart of the ship repair facility and which, according to Du Plessis (1976), was built during World War I, commissioned in 1919 and could originally cater for craft up to 250 tons.

A number of photographs of the harbour from the same period show the early configuration of the lead-in jetties which consisted of four wooden dolphins to line vessels up to the slipway instead of the two long jetties that currently exist (**Figures 51 and 52**). This configuration is shown in the South African Railways and Harbours plan of the harbour dated 1931 (**Figure 53**). During subsequent harbour work in between 1969 and 1972, the slipway was lengthened and strengthened to handle vessels of up to 500 tons (Du Plessis 1976). It seems likely that it was at this stage the two lead-in jetties replaced the dolphins.



Figure 51: Postcard of Mossel Bay probably dating from the 1920s or 1930s (Source: <http://www.hotelportaodiaz.co.za/home>)

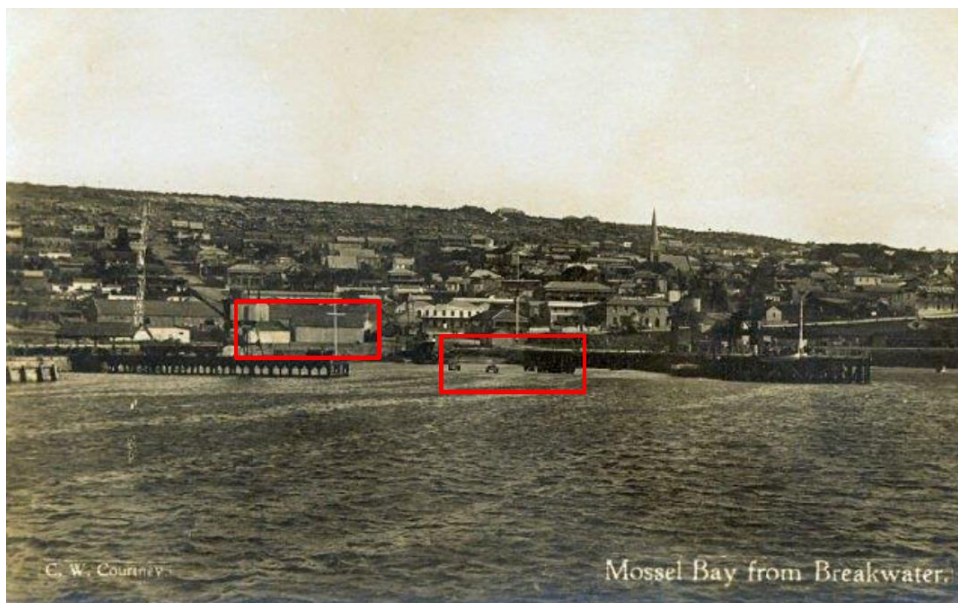


Figure 52: Postcard of Mossel Bay also dating from the 1920s or 1930s, looking towards the ship repair facility from the breakwater (Source: <http://www.ponto.co.za/old-mossel-bay-pics.html>)

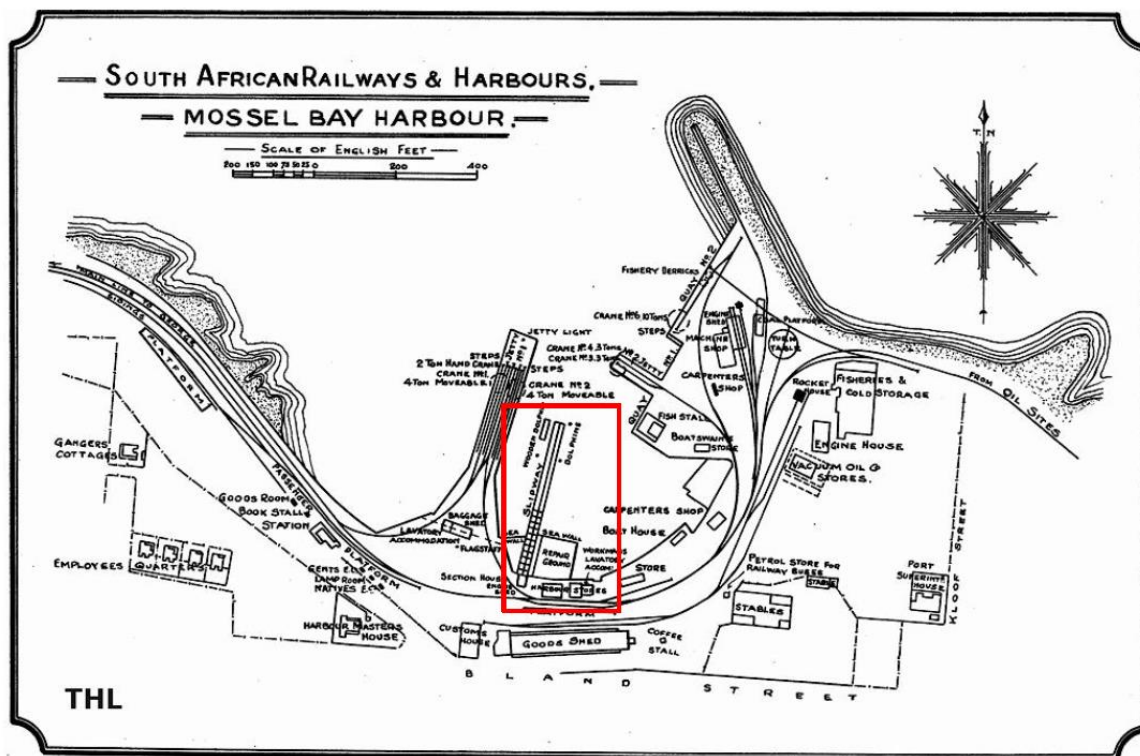


Figure 53: Plan of Mossel Bay Harbour from the General Managers' Annual Report for 1931 which shows the ship repair facility in place. Note the wooden dolphins in the position now occupied by the lead-in jetties (Source: <https://sites.google.com/site/soulorailway/home/system-3-1/the-garden-route-mossel-bay-to-klipplaat>)

15.7 Transportation

The site is zoned as a transportation zone. The ship repair facility is easily accessible and acknowledges the hierarchy of circulation for pedestrians, vehicles, cycles and the main service which is the Ship dock / slipway facility. The Port of Mossel Bay is accessible by road and railway networks, and is an excellent connection point to the consumer markets and industrial zones of the Western Cape hinterland. Tourism is also a booming industry, with fully booked accommodation in the holiday months. There are no dedicated areas within the Port of Mossel Bay for cruise liners. There are no facilities available for passenger terminal but port of Mossel Bay use Quay 4. Marine traffic at the Port of Mossel Bay is not very high compared to other ports.

15.8 Aesthetic Qualities

The main land users are TNPA and industrial and commercial leaseholders (**Figures 54 to 59**). The sense of place for the Mossel Bay Port can be classified as industrial and commercial, with the usual particulars of a Port.



Figure 54: Boat companies in Mossel Bay



Figure 55: Mossel Bay National Sea Rescue Institute



Figure 56: Commercial businesses in Mossel Bay



Figure 57: Flea Market adjacent to the Port of Mossel Bay



Figure 58: Industrial businesses in Mossel Bay



Figure 59: Restaurant businesses in Mossel Bay

15.9 Existing Infrastructure

The existing ship repair facility has been discussed in Section 4.1. All existing infrastructure that will be affected by the proposed upgrade is owned by TNPA as part of the Port of Mossel Bay.

16 SUMMARY OF SPECIALIST STUDIES

The following Specialist Studies were undertaken as part of the BA Process:

1. Marine Environmental Impact Assessment – This study was required since the project is located in the intertidal and subtidal zone of the harbour; and
2. Phase 1 Heritage Impact Assessment – This study was required because of the size of the proposed development and the potential occurrence of heritage resources and structures older than 60 years at or near the ship repair facility.

16.1 Marine Environmental Impact Assessment

16.1.1 Details of the Specialist

Specialist	
Organisation:	CRO Environmental Management
Name:	Shael Harris
Qualifications:	PhD Doctorate (Marine Biology)
Affiliation:	South African Council for Natural Scientific Professions (SACNASP) Pr. Nat. Sci. (Practice no. 400056/99): Marine Scientist

16.1.2 Main Findings

The main impacts due to the upgrade of the ship repair facility identified for this study were similar for the construction and operational phases, except the impacts for operational phase were of longer duration (see table below). Some loss of benthic habitat will occur permanently due to the extension of the sideslip and shows a high significance rating before mitigation. However, improvement of water quality by management measures will allow the benthic habitat around the slipway to recover to some degree, improving the significance rating to very low. After mitigation all impacts are reduced to some degree.

BEFORE MITIGATION	CONSEQUENCE					PROBABILITY	OVERALL SIGNIFICANCE
	A. Extent	B. Intensity	C. Duration	A+B+C	Rating		conseq + prob
Impacts	Construction phase						
Loss of benthic habitat	1	3	1	5	Low	Definite	LOW
Impacts on water quality	1	3	1	5	Low	Probable	LOW
Re-suspension of contaminated sediments	1	3	1	5	Low	Probable	LOW
Pollution and waste	1	2	1	4	V. low	Probable	LOW
Construction noise and vibration	1	2	1	4	V. low	Definite	VERY LOW
	Operational phase						
Loss of benthic habitat	1	3	3	7	High	Definite	HIGH
Impacts on water quality	1	2	3	6	Med	Probable	MED
Re-suspension of contaminated sediments	1	2	3	6	Med	Probable	MED
Pollution and waste	1	2	3	6	Med	Probable	MED

AFTER MITIGATION	CONSEQUENCE					PROBABILITY	OVERALL SIGNIFICANCE
	A. Extent	B. Intensity	C. Duration	A+B+C	Rating		conseq + prob
Impacts	Construction phase						
Loss of benthic habitat	1	2	1	4	V. low	Definite	VERY LOW
Impacts on water quality	1	2	1	4	V. low	Probable	VERY LOW
Re-suspension of contaminated sediments	1	2	1	4	V. low	Probable	VERY LOW
Pollution and waste	1	1	1	3	V. low	Probable	VERY LOW
Construction noise and vibration	1	1	1	3	V. low	Definite	VERY LOW
	Operational phase						
Loss of benthic habitat	1	2	2	5	Low	Definite	LOW
Impacts on water quality	1	2	1	4	V. low	Possible	VERY LOW
Re-suspension of contaminated sediments	1	2	2	5	Med	Possible	LOW
Pollution and waste	1	2	1	4	V. low	Possible	VERY LOW

16.1.3 Conclusions and Recommendations

The current ship repair facility in the Port of Mossel Bay is in a poor state and requires an upgrade, not only to improve the infrastructure to serve the fishing vessels but also have less impact on the marine environment. The current waste management, drainage system, lack of bunding is resulting in contaminants being washed via stormwater into the bay. This is supported by the TNPA Long term monitoring results that have recorded the highest values of some metals, turbidity, and *E.coli* at the stations around the slipway, lead in jetty, and station 2. This is reflected in the sediment-dwelling organisms, as the lowest macro benthic abundance was recorded at Station 1 in the innermost part of the port between the Slipway and Quay 1, which suggests a high impact area.

Both alternative options have similar impacts but Alternative 2 has a greater extent of impacts because of the complete demolition and replacement of the slipway (above and under water). Therefore Alternative 1 is proposed.

The mitigation measures in the study need to be included in the overall EMP and an ECO appointed to monitor the water quality during construction and operation of the ship repair facility. Future studies on the fish fauna in the port would be useful and perhaps be included in the long term monitoring programme.

16.2 Phase 1 Heritage Impact Assessment

16.2.1 Details of the Specialist

Specialist	
Organisation:	ACO Associates CC
Name:	John Gribble
Qualifications:	Master of Arts (Archaeology)
Affiliation (if applicable):	<ul style="list-style-type: none"> • Member: Association of Southern African Professional Archaeologists (No. 043) • Principal Investigator: Maritime and Colonial Archaeology, ASAPA CRM Section • Field Director: Stone Age Archaeology, ASAPA CRM Section • Member: Chartered Institute for Archaeologists (CIfA), United Kingdom • Class III Diver (Surface Supply), Department of Labour (South Africa) / UK (HSE III)

16.2.2 Main Findings

The ship repair facility was built in c.1919. The age of the facility and its machinery and issues related to maintenance lead to the recent downgrading of its operational capacity. The pre-colonial landscape of Varkens Bay, in which the port is located, is highly modified and there is no record of or evidence for archaeological sites or material at or in the vicinity of the ship repair facility. The construction in 1895 of the seawall which forms part of the ship repair facility resulted in the burial under fill of the dunes surrounding Varkens Bay and the current administration buildings were erected on this fill. There is thus some potential for the presence of pre-colonial archaeological sites or material under the existing administration buildings, but this potential is assessed to be very low.

In respect of palaeontological resources, SAHRA's palaeosensitivity map indicates that the port is located in an area of low to insignificant palaeontological sensitivity and this assessment found no evidence of any palaeontological occurrences at or in the immediate vicinity of the ship repair facility. The built fabric, structures and features which together comprise the ship repair facility are, with the exception of the lead-in jetties, older than 60 years of age and protected by the NHRA. Their heritage significance is assessed to be mainly local and together they contribute to the evolving cultural landscape of the Port of Mossel Bay.

16.2.3 Conclusions and Recommendations

Although the proposed upgrade of the ship repair facility will have real and potential impacts on heritage resource types protected by the NHRA, this assessment suggests that the significance of these resources and the level of anticipated impact are outweighed by the long-term benefits to the survival of this historic facility that the upgrade will bring.

A permit to demolish and rebuild the submerged portion of the slipway will be needed from SAHRA and it is recommended that the required application for permission to repair and upgrade the slipway and side-slip areas above the waterline is also made to SAHRA. This will

ensure that the works related to the marine aspects of the upgrade are dealt with by a single heritage agency. An application will need to be made to HWC for the demolition of the administration buildings.

No archaeological mitigation is recommended but in the event of human remains being uncovered during work, all activities in the vicinity must cease until a suitably qualified archaeologist and SAHRA and HWC have been notified, the significance of the material has been assessed and a decision has been taken as to how to deal with it.

A protocol for reporting palaeontological finds should be commissioned from a suitably qualified palaeontologist and implemented during all intrusive ground works.

It is recommended that the existing ship cradle and winch house machinery that is to be removed is recorded before removal and is then either offered to a suitable local museum or that provision is made for its retention and display at the ship repair facility.

Although the historical seawall will not be affected by the proposed upgrade care must be taken in both the design and construction of the new administration building and in work related to other elements of the upgrade that the wall is not compromised or damaged in any way.

17 IMPACT ASSESSMENT

17.1 Overview

This section focuses on the pertinent environmental impacts that could potentially be caused by the proposed upgrade of the ship repair facility during the pre-construction, construction and operational phases of the project.

Please note that an “impact” refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.

The impacts to the environmental features are linked to the project activities, which in broad terms relate to the proposed development and its associated services and infrastructure.

Impacts were identified as follows:

- Impacts associated with listed activities contained in GN No. R. 983 and R. 985, for which authorisation has been applied for;
- Issues highlighted by environmental authorities;
- Comments received during public participation;
- An appraisal of the project description and the receiving environment; and
- Findings from Specialist Studies.

17.2 Project Activities

For the purposes of effective and efficient monitoring, the aspects of construction are outlined separately for pre-construction, construction and operational phases. In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project life-cycle, as shown below:

Table 11: Activities associated with the Pre-construction Phase

PRE-CONSTRUCTION PHASE	
Project Activities	
1.	Applicant to appoint ECO
2.	Negotiations and agreements with affected landowners and stakeholders
3.	Detailed engineering design
4.	Detailed geotechnical design
5.	Site survey
6.	Procurement of contractors
7.	Mark construction servitude
8.	Pre-construction photographic records
9.	Development and approval of method statements
10.	Development and approval of construction plans
11.	Development of employment strategy
12.	Construction site planning, access and layout
Environmental Activities	
1.	Diligent compliance monitoring of the EA, EMPr and other relevant environmental legislation
2.	Obtain permits from SAHRA and/or Heritage Western Cape
3.	Ongoing consultation with affected landowners and affected parties

Table 12: Activities associated with the Construction Phase

CONSTRUCTION PHASE	
Project Activities	
1.	Site establishment

2. Fencing of the construction area
3. Delivery of construction material
4. Transportation of equipment, materials and personnel
5. Storage and handling of material
6. Cut and cover activities
7. Stockpiling (sand, crushed stone, aggregate, etc.)
8. Stormwater control mechanisms
9. Management of topsoil and spoil
10. Waste and wastewater management
11. Traffic control measures
12. Site security
13. Electrical supply
14. Construction (including demolition of the jetties, installing the docking arms, repairing the slipway, replacing the cradle, demolishing and rebuilding the winch house and associated buildings, installing the stormwater management and recycling system, and building the substation)
Environmental Activities
1. Reinstatement and rehabilitation of construction domain
2. Diligent compliance monitoring of the EA, EMPr and other relevant environmental legislation
3. Conduct environmental awareness training
4. Implement EMPr
5. Ongoing consultation with <i>affected</i> landowners and affected parties

Table 13: Activities associated with Operational Phase

OPERATIONAL PHASE
Project Activities
1. Site access arrangements and requirements
2. Water quality monitoring
3. Operation of the ship repair facility
4. Repair and maintenance works of the ship repair facility at the Mossel Bay Port

Environmental Activities
1. Ongoing consultation with affected landowners and affected parties
2. Stormwater management
3. Pollution control measures

17.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact. **Tables 14, 15 and 16** provide the environmental aspects that have been identified for the proposed project, are linked to the project activities (note that only high level aspects are provided).

Table 14: Environmental aspects associated with the Pre-Construction Phase

ENVIRONMENTAL ASPECTS
Pre-construction Phase
1. Insufficient construction site planning and layout
2. Poor consultation with affected landowners, affected parties, stakeholders and authorities
3. Site-specific environmental issues not fully understood
4. Inadequate environmental and compliance monitoring
5. Absence of relevant permits
6. Poor waste management
7. Absence of ablution facilities

Table 15: Environmental aspects associated with the Construction Phase

ENVIRONMENTAL ASPECTS
Construction Phase
1. Poor consultation with affected landowners and affected parties
2. Inadequate environmental and compliance monitoring

ENVIRONMENTAL ASPECTS	
Construction Phase	
3. Lack of environmental awareness creation	
4. Indiscriminate site clearing	
5. Poor site establishment	
6. Poor traffic management	
7. Disturbance of topsoil	
8. Disruptions to existing services	
9. Inadequate storage and handling of material	
10. Inadequate storage and handling of hazardous material	
11. Poor maintenance of equipment and plant	
12. Poor management of labour force	
13. Pollution from ablution facilities	
14. Inadequate management of construction camp	
15. Poor waste management practices – hazardous and general solid, liquid	
16. Poor management of pollution generation potential	
17. Poor management of water	
18. Loss of marine biodiversity	
19. Disruption of archaeological and culturally significant features	
20. Dust and emissions	
21. Noise nuisance due to construction activities	
22. Poor reinstatement and rehabilitation	

Table 16: Environmental aspects associated with the Operational Phase

Operational Phase	
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1. Poor consultation with affected landowners, affected parties, stakeholders and authorities
2. Poor stormwater management
3. Inadequate environmental and compliance monitoring
4. Inadequate water quality monitoring
5. Inadequate management of access, routine maintenance and maintenance works

17.4 Potential Significant Environmental Impacts

Environmental impacts are the change to the environment resulting from an environmental aspect, whether desirable or undesirable. Refer to **Tables 17** and **18** for the potential significant impacts associated with the preceding activities and environmental aspects for the pre-construction, construction and operational phase.

Table 17: Potential significant environmental impacts during Construction Phase

Feature	Impact
Geology and Soil	<ul style="list-style-type: none"> • Unsuitable geological conditions • Soil erosion (land clearance and construction activities) • Soil pollution (e.g. hydrocarbon and cement spillages) • Soil contamination through spillages and leakages • Poor stormwater management during construction
Marine Environment	<ul style="list-style-type: none"> • Loss of benthic habitat due to removal of existing structures and expansion of sideslip platform • Impacts on water quality • Re-suspension of contaminated sediments during construction • Pollution and waste • Construction noise and vibration
Socio – Economic Environment	<ul style="list-style-type: none"> • Generation of employment opportunities for local community (positive) • Nuisance from noise and dust • Construction related safety risks
Air Quality	<ul style="list-style-type: none"> • Excessive dust levels • Greenhouse gas emissions
Noise	<ul style="list-style-type: none"> • Localised noise increase • Noise nuisance
Heritage Resources	<ul style="list-style-type: none"> • Destruction of buried pre-colonial archaeological sites and/or materials • Destruction of buildings and structures most of which are more than 60 years of age and thus protected by the NHRA • Impact on evolving cultural landscape of the Port of Mossel Bay
Transportation	<ul style="list-style-type: none"> • Construction-related traffic
Aesthetics	<ul style="list-style-type: none"> • Construction related impacts on visual quality of port
Existing Infrastructure	<ul style="list-style-type: none"> • Repairing of existing infrastructure • Relocation of structures

Table 18: Potential significant environmental impacts for Operational Phase

Feature	Impact
Marine Environment	<ul style="list-style-type: none"> Habitat health impacts/losses resulting from new ship repair facility Impacts on water quality Re-suspension of contaminated sediments during dredging Pollution and waste
Socio – Economic	<ul style="list-style-type: none"> Generation of employment opportunities for local community (positive) Contribution to local economy (positive) Improved safety of the ship repair facility for utilisation by vessels Providing a technologically modern facility that can provide ship repair services both efficiently and safely. Phakisa Focus: Engineering/Infrastructure aspects, alignment with Ports Act and other statutory requirements and technical skills improvement Increasing the volume of vessels handled per year and increasing the size of vessels that can be handled. Phakisa Focus: becoming “port of call” for ship repair on east coast of South Africa Widening the ship repair and support services that can be offered by the Port. Phakisa Focus: Broadening Transnet’s internal skills base Stimulate local and regional supply chain opportunities due to increased vessel handling. Phakisa Focus: Strategic Development Initiatives and empowerment programme Provide a mechanism for the expansion of employment and training opportunities in ship repair and heavy mechanical industry sectors. Phakisa Focus: training and development focusing on advanced technical skills levels Increase the facilities’ utilisation Increase revenue generation for TNPA
Noise	<ul style="list-style-type: none"> Localised noise increase now that the facility will be running again
Heritage Resources	<ul style="list-style-type: none"> Loss of archaeological sites, protected built environment and impact on evolving cultural landscape of the Port of Mossel Bay
Transportation	<ul style="list-style-type: none"> Increase in traffic of vessels using the facility
Aesthetics	<ul style="list-style-type: none"> Improved visual quality of port during operation due to the upgrade and modernisation of the facility

17.5 Impact Assessment Methodology

The impact assessment carried out for each environmental impact that may result from the proposed project, forms the basis for determining which management measures are required to prevent or minimise these impacts. The management measures are furthermore a means by which the mitigation measures, determined in the impact assessment are translated to action items required to prevent or keep those impacts that cannot be prevented within acceptable levels.

Mitigation should strive to abide by the following hierarchy (1) prevent; (2) reduce; (3) rehabilitate; and/or (4) compensate for the environmental impacts.



Figure 60: Mitigation hierarchy

In order to establish best management practices and prescribe mitigation measures, the following project-related information needs to be adequately understood:

- **Activities** associated with the proposed project;
- **Environmental aspects** associated with the project activities;
- **Environmental impacts** resulting from the environmental aspects; and
- The nature of the surrounding **receiving environment**.

Information provided by specialists was 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:

$$\text{Overall Score} = (N \times M \times S) \times (E + D + P)$$

Where:

- N = Nature;
- E = Extent
- M = Magnitude
- D = Duration
- P = Probability
- S = Significance

Table 19: Impact methodology table

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 Mitigation/Low	After Residual Impact Mitigation/Medium	After Impact Cannot be Mitigated/High	
0	1	2	3	

The following definitions apply:

For the methodology of the impact assessment, the analysis is conducted on a quantitative basis with regard to the nature, extent, magnitude, duration, probability and significance of the impacts. The following definitions and scoring system apply:

Nature (/Status)

The project could have a positive, negative or neutral impact on the environment.

Extent

- Local – extend to the site and its immediate surroundings.
- Regional – impact on the region but within the province.
- National – impact on an interprovincial scale.
- International – impact outside of South Africa.

Magnitude

Degree to which impact may cause irreplaceable loss of resources.

- Low – natural and social functions and processes are not affected or minimally affected.
- Medium – affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High – natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration

- Short term – 0-5 years.
- Medium term – 5-11 years.
- Long term – impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent – mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability

- Almost certain – the event is expected to occur in most circumstances.
- Likely – the event will probably occur in most circumstances.
- Moderate – the event should occur at some time.
- Unlikely – the event could occur at some time.
- Rare/Remote – the event may occur only in exceptional circumstances.

Significance

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-

0 – Impact will not affect the environment. No mitigation necessary.

1 – No impact after mitigation.

2 – Residual impact after mitigation.

3 – Impact cannot be mitigated.

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 = $(-1 \times 3 \times 3) \times (4+4+5) = -117$

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 20: 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

18 IMPACT MANAGEMENT

The impacts for each environmental feature identified are assessed for the pre-construction, construction, and operation phases for the proposed upgrade of the ship repair facility.

18.1 Geology and Soil

18.1.1 Potential Impacts

The proposed development will require suitable geological foundation conditions, which were confirmed through the geotechnical investigations as part of the Feasibility Study.

The EMPr will include suitable stormwater management measures to prevent the occurrence of erosion.

Soil may be polluted by poor storage of construction material, spillages and inadequate housekeeping practices. Specific mitigation measures are contained in the EMPr, where the primary objective is the effective and safe management of materials on site, in order to minimise the impact of these materials on the biophysical environment. The same objective applies to the correct management and handling of hazardous substances (e.g. fuel).

18.1.2 Impact Assessment

Geology and Soil							
Project Life-cycle:	Construction and Operation						
Potential Impact:	Soil erosion						
Proposed Mitigation:	<ul style="list-style-type: none"> Stabilisation of cleared areas to prevent and control erosion. The method chosen (e.g. watering, planting, retaining structures, commercial anti-erosion compounds) will be selected according to the site specific conditions. Drainage management should also be implemented to ensure the minimization of potential erosion. Rehabilitate all areas disturbed during construction. Monitoring to be conducted to detect erosion. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Medium	Likely	2	-28
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

Geology and Soil							
Project Life-cycle:	Construction and Operation						
Potential Impact:	Contamination of Soil						
Proposed Mitigation:	<ul style="list-style-type: none"> Wind and water erosion-control measures to be implemented to prevent loss of topsoil. After excavation, all soils must be replaced in the same order as they were removed. Remove, stockpile and preserve topsoil for re-use during rehabilitation. Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost. 						

	<ul style="list-style-type: none"> Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed. Stockpiled soil shall be protected by erosion-control berms. Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed. Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed. Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and microorganisms in the soil. Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be coordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Medium	Likely	2	-28
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

18.2 Marine Environment

This section discusses the impacts identified by the Marine Specialist and extracted from the Marine Environment Impact Assessment (**Appendix 6A**).

18.2.1 Potential Impacts and Impact Assessment during Construction Phase

Loss of benthic habitat due to removal of existing structures and expansion of sideslip platform

Temporary disturbance of benthic marine biota will occur due to underwater construction activities that involve demolishing and removal of existing structures. To repair the existing slipway, the underwater portion of the rail support beams will be rebuilt, so construction workers will be working in the subtidal zone and trampling on benthic macrofauna.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	High 3	Short term 1	Low 5	Definite	LOW
Mitigation measures: <ol style="list-style-type: none"> 1) Restrict construction activities, such removal of old concrete sections, to area around slipway and lead in jetty 2) Build the extension of the sideslip platform to minimum size required 3) Remove any building rubble that gets deposited on the benthic zone as soon as possible 						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Definite	VERY LOW

Impacts on water quality

Turbidity and total suspended solids (TSS) provide complimentary information on water quality. Turbidity is a measure of water clarity and in harbours anthropogenic sources of increased turbidity and suspended solids include stormwater runoff, sewage discharge, industrial waste, vessel propeller wash and dredging. During construction at the launch ramp

and slipway vessel propeller wash, dredging and increased activity in the area will be the influencing factors. The long term monitoring study used the following to define water quality classification criteria for turbidity as:

Good: ≤ 10 NTU

Fair: $>10 - \leq 20$ NTU

Poor: >20 NTU

The long term monitoring study in the summer survey has identified this area of the port (Station 1) to have the highest levels of turbidity in bottom waters (9 NTU). The innermost part of the port where the ship repair facility is located is very sheltered so only limited turnover of water with tidal exchange will occur, to dissipate any increase in sedimentation due to construction activities.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	High 3	Short term 1	Low 5	Probable	LOW
Mitigation measures: <ol style="list-style-type: none"> 1) Build new concrete structures as a precast to avoid any concrete spills in the water 2) Ensure proper stormwater drainage in place to reduce potential runoff from construction activities on slipway 3) When working underwater minimize or avoid stirring up sediment that will impact on turbidity 						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Probable	VERY LOW

Re-suspension of contaminated sediments during construction

The long term monitoring programme identified the launch ramp and slipway areas as poor water quality, using a suite of indices. The report suggests that the anthropogenic sources of metals that were frequent and/or significant contaminants of sediment collected at station 1 near the slipway, are from the ship repair facility. Such contaminants would come from the welding and grinding of metal structures, such as the slipway rails, that will be needed for building the new slipway. Re-suspension of contaminants will occur due to construction activities on the benthic environment.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	High 3	Short term 1	Low 5	Probable	LOW
Mitigation measures: <ol style="list-style-type: none"> 1) Sediments at the proposed site must be tested for contamination by heavy metals, ammonia, cyanide, fluoride, hydrogen sulphide, organotin (tributyltin) and total petroleum hydrocarbons 2) Where dredging is required, such as extension of side slipway, deposit dredged material according to the TNPA maintenance dredging management plan 3) When dredging use least-impact techniques such as: <ul style="list-style-type: none"> • The clamshell dredger • During slack tide and low tide periods • At low to moderate excavations rates • Using bubble net technology to prevent the transport of sediment to other parts of the Bay • Strict hopper loading management to avoid the loss of dredge spoil into the bay during transport. 4) When working underwater minimize or avoid stirring up sediment that will re-suspend contaminated sediments 						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Probable	VERY LOW

Pollution and waste

Contamination of the water and sediments around the ship repair construction site can occur by inappropriate disposal of waste materials, handling of raw materials, fabrication and surface treatment of basic steel parts, joining and assembly of fabricated parts into block (concrete), and erection of launch ramp and slipway structures through the fitting and welding of blocks.

Since the site of the ship repair facility is at the innermost part of the port, it appears that any floating debris (especially plastics) tend to land up on the rocks and beach area at this site. The source of this debris is not known and could be from anywhere in the port, so management of waste on site must be carefully monitored. Construction material waste needs to be contained in designated areas on site. Currently there is a skip on site where a mixture of waste is deposited, and with other waste (metal, wood) left in other areas around the site.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	High 3	Short term 1	Very Low 4	Probable	LOW
Mitigation measures: 1) Ensure waste disposal license is in place for construction waste 2) Demarcate waste areas clearly with signage and ensure these areas are bunded 3) Ensure construction workers are educated about waste recycling and waste areas 4) Remove other waste that drifts into the study area, even if not from construction activities e.g. plastics						
After mitigation	Local 1	Low 1	Short term 1	Very low 3	Probable	VERY LOW

Construction noise and vibration

The use of a vibratory hammer and rock drill underwater to remove damaged piles and concrete structure on the slipway would result in levels of vibration and noise that may affect fish in the vicinity. Local fish and avifauna would likely vacate this area of the bay during high intensity activities.

An underwater noise impact study that was done for the Aberdeen Harbour expansion concluded that, with the exception of explosive blasting, construction activities such as drilling, piling, and dredging generate relatively low levels of underwater noise hence minimal auditory injury for cetaceans and fish present in the harbour.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	Med 2	Short term 1	Very Low 4	Definite	LOW
Mitigation measures: 1) Limit use of a vibratory hammer and rock drill underwater to remove damaged piles to during slack and low tide periods						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Definite	VERY LOW

18.2.2 Potential Impacts and Impact Assessment during Operational Phase

Habitat health impacts/losses resulting from new ship repair facility

The expansion of the sideslip platform, to the right side of the slipway, will permanently disturb the benthic habitat. However the area of this expanded sideslip platform is small (approximately 300m²) and the macro benthos is already in a disturbed state.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	High 3	Long term 3	High 7	Definite	HIGH
Mitigation measures: 1) Monitor maintenance activities and educate workers on habitat health 2) Minimise trampling on benthic habitats						
After mitigation	Local 1	Med 2	Med term 2	Low 5	Definite	LOW

Impacts on water quality

The South African Water Quality Guidelines for Coastal Marine Waters provide target values for a suite of water quality indicators. A salinity target of 33 – 36 NTU is defined to control marked, non-natural changes in the salinity of water due, for example, to the discharge of low salinity wastewater and cleaning of vessel hulls with freshwater. A stormwater management and recycling system will be installed to manage the freshwater used in ship cleaning, which will minimise any freshwater input into the marine environment.

Although this part of the port by the ship repair facility is already compromised, as indicated by the long term monitoring programme, it is possible to improve the water quality by providing proper stormwater management, freshwater recycling system, upgrade services for sewer and water (salt and fresh), and adequate bunding.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	Med 2	Long term 3	Med 6	Probable	MED
Mitigation measures: 1) For underwater maintenance minimize or avoid stirring up sediment that will impact on turbidity 2) Ensure adequate bunding and stormwater system to collect pollution sources such as surface cleaning, treatment operations; oil transfer operations; servicing of machinery and other equipment, and side slipping activities. 3) Use a freshwater recycling system – freshwater is used to clean hulls of ship 4) Upgrade services for sewer and water (salt and fresh) 5) Monitor basic water quality indicators such as temperature, salinity and turbidity on a regular basis to compliment the long term monitoring programme. The South African Water Quality Guidelines for Coastal Marine Waters provide target values for a suite of water quality indicators (see Table 6.1)						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Probable	VERY LOW

Re-suspension of contaminated sediments during dredging

A waterside impact during the operational phase is the influence of vessel propeller wash on the physical and chemical properties of the water column, and stirring up bottom sediment. A plume of sediment in the water column would be visible as a result of this impact. Remobilisation of contaminants in sediment by mechanical disturbance would occur during vessel propeller wash, but would settle from the water column after a relatively short period. A significant source of metals that contaminated the sediment in the port was found at Station 1 near the slipway and launch ramp. This suggests strongly that this source is from the operation of the ship repair facility. This would be due to the welding and grinding of metal structures on vessels, sandblasting of vessel hulls and so on is bound to introduce metal fragments and metal infused paint flakes to port waters or onto hard structures from where they can be mobilised into the port by wind and stormwater runoff.

Other sources of metals in and to the port undoubtedly include antifouling coatings applied to the hulls of vessels, in which tributyltin, copper and zinc are used as the active biocide, zinc anodes used for corrosion protection, and metals washed from road and quay surfaces by stormwater runoff.

Support for the contention that the vessel repair facility is a significant source of metals in the Port of Mossel Bay comes from the fact that tributyltin concentrations in sediment at Station 2 were far higher than elsewhere in the port. Tributyltin was historically widely used as the active agent in antifouling coatings on the hulls of vessel, although now prohibited as adopted by the International Convention on the Control of Harmful Anti-fouling Systems on Ships 2008. However, in South Africa, the use of tributyltin on vessels <25 m has been banned, but no regulations are in place for larger vessels.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	Med 2	Med term 3	Med 6	Probable	MED
Mitigation measures: <ol style="list-style-type: none"> 1) Where maintenance dredging is required,, deposit dredged material according to the TNPA maintenance dredging management plan 2) When dredging use least-impact techniques such as: <ul style="list-style-type: none"> • The clamshell dredger • During slack tide and low tide periods • At low to moderate excavations rates • Using bubble net technology to prevent the transport of sediment to other parts of the Bay • Strict hopper loading management to avoid the loss of dredge spoil into the bay during transport. 3) When working underwater minimize or avoid stirring up sediment that will re-suspend contaminated sediments 						
After mitigation	Local 1	Med 2	Med term 2	Very low 5	Possible	LOW

Pollution and waste

Metal grinding is carried out in outdoor work areas of ship repair facilities using portable handheld grinders. These particulates are released during the abrasion process and have the greatest potential for emitting pollutants in the form of fugitive air emissions of metal dust and fumes, as solid waste and as metal dust and chips from waste grinding tools directly to the air and soil as well as to waterways through stormwater runoffs.

Metal grinding materials such as grinding discs and grinding rocks are characteristically fabricated by attaching an abrasive element to a backing with chemical binders. Common materials for the abrasives in these tools are aluminum oxide, silicon carbide, and zirconium oxide. Oil from the winch system most likely drips onto the ground and would then become part of the stormwater runoff into the harbour. Various capture and collection systems help minimise environmental exposure by reducing pollutant loading during metal grinding processes. These include vacuum dust extractors, area containment (bundling, ground tarps and curtain partitions), and area ventilation dust collectors.

	Extent	Intensity	Duration	Consequence	Probability	Significance
Before mitigation	Local 1	Med 2	Long term 3	Med 6	Probable	MED
<u>Mitigation measures:</u> 5) Ensure waste disposal license is in place for waste 6) Demarcate waste areas clearly with signage and ensure these areas are bunded 7) Ensure construction workers are educated about waste recycling and waste areas 8) Remove other waste that drifts into the study area, even if not from construction activities e.g. plastics						
After mitigation	Local 1	Med 2	Short term 1	Very low 4	Possible	VERY LOW

18.3 Socio-Economic Environment

18.3.1 Potential Impacts

Positive impacts include the creation of work opportunities for the local community during construction, as well as long-term work during the operation and maintenance of the Port of Mossel Bay. One of the main implications will be the provision of an operational ship repair facility for the local fisherman. The upgraded ship repair facility will contribute to the repurposing of the Historic CBD into a Tourist Node to redevelop the harbour as Port and Waterfront. The beneficial impacts during operation can be summarised as follows:

- Generation of employment opportunities for local community
- Contribution to local economy
- Improved safety of the ship repair facility for utilisation by vessels

- Providing a technologically modern facility that can provide ship repair services both efficiently and safely. Phakisa Focus: Engineering/Infrastructure aspects, alignment with Ports Act and other statutory requirements and technical skills improvement
- Increasing the volume of vessels handled per year and increasing the size of vessels that can be handled. Phakisa Focus: becoming “port of call” for ship repair on east coast of South Africa
- Widening the ship repair and support services that can be offered by the Port. Phakisa Focus: Broadening Transnet’s internal skills base
- Stimulate local and regional supply chain opportunities due to increased vessel handling. Phakisa Focus: Strategic Development Initiatives and empowerment programme
- Provide a mechanism for the expansion of employment and training opportunities in ship repair and heavy mechanical industry sectors. Phakisa Focus: training and development focusing on advanced technical skills levels
- Increase the facilities’ utilisation
- Increase revenue generation for TNPA

Construction-related impacts include traffic disruptions (for terrestrial and marine), dust, noise and visual impacts.

18.3.2 Impact Assessment

Disturbance arising from the construction phase							
Project Life-cycle:	Construction						
Potential Impact:	Increase in Dust						
Proposed Mitigation:	<ul style="list-style-type: none"> • Dust and disturbance can be mitigated through the use of appropriate dust suppression mechanisms • Adherence to road signage can be added as an advantage 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Low	Short	Likely	1	-6
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

Disturbance arising from the construction phase							
Project Life-cycle:	Construction						
Potential Impact:	Worker Health and Safety						
Proposed Mitigation:	<ul style="list-style-type: none"> • The provisions of the OHS Act 85 of 1993 and the Construction Regulations of 2014 should be implemented on site 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Moderate	1	-5

Disturbance arising from the construction phase							
Project Life-cycle:	Construction						

Potential Impact:	Security						
Proposed Mitigation:	<ul style="list-style-type: none"> The site should be fenced for the duration of construction All contractors' staff should be easily identifiable through their respective uniforms 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Moderate	1	-5

Economic opportunities arising from the construction phase							
Project Life-cycle:	Construction						
Potential Impact:	<ul style="list-style-type: none"> Job Creation and Skills Development Increased revenue for TNPA 						
Proposed Mitigation:	<ul style="list-style-type: none"> The main contractor should employ non-core labour from the local community as far as possible during the construction phase. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	+	Local	Medium	Short	Likely	2	+24
With Mitigation	+	Local	Medium	Short	Likely	3	+30

Upgrading of the ship repair facility							
Project Life-cycle:	Operation						
Potential Impact:	Improved safety of the ship repair facility for utilisation by vessels						
Proposed Mitigation:	<ul style="list-style-type: none"> Mitigation is not necessary for this positive impact. TNPA must ensure the project is delivered and meets the objectives of Operation Phakisa. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
	+	Regional	High	High	Almost Certain	3	+60

18.4 Air Quality

18.4.1 Potential Impacts

Potential impacts during the construction phase include:

- Dust will be generated during the construction period from various sources, including stockpiles, use of access roads, transportation of spoil material and general construction activities on site; and
- Exhaust emissions from vehicles and equipment.

Mitigation measures are included in the EMP to ensure that the air quality impacts during the construction phase are suitably monitored (dust fallout and particulate matter) and managed and that regulated thresholds are not exceeded.

18.4.2 Impact Assessment

Air Quality	
Project Life-cycle:	Construction
Potential Impact:	Excessive dust levels as a result of construction activities

Air Quality							
Proposed Mitigation:	<ul style="list-style-type: none"> Appropriate dust suppression measures or temporary stabilising mechanisms to be used when dust generation is unavoidable (e.g. dampening with water, chemical soil binders, straw, brush packs, chipping), particularly during prolonged periods of dry weather. Dust suppression to be undertaken for all bare areas, including construction area and access roads. Note that all dust suppression requirements should be based on the results from the dust monitoring and the proximity of sensitive receptors. Speed limits to be strictly adhered to. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Low	Short	Likely	1	-6
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

18.5 Noise

18.5.1 Potential Impacts

During construction, localised increases in noise and vibration will be caused by construction activities. Localised noise will also increase when that the facility is operational again.

Noise that emanates from construction and operational activities will be addressed through targeted best practices for noise monitoring and management in the EMP. The associated regulated standards need to be adhered to.

Project personnel working on the site will experience the greatest potential exposure to the highest levels of noise and vibration. Workplace noise and vibration issues will be managed as part of the Occupational Health and Safety Management System to be employed on site, which will include specific measures aimed at preventing hearing loss and other deleterious health impacts.

18.5.2 Impact Assessment

Noise							
Project Life-cycle:	Construction						
Potential Impact:	Excessive noise levels as a result of construction and operation activities						
Proposed Mitigation:	<ul style="list-style-type: none"> The provisions of SABS 1200A will apply to all areas within audible distance of residents. Working hours to be agreed upon with Project Manager, so as to minimise disturbance to landowners/occupiers and community members. Construction activities generating output levels of 85 dB or more will be confined to normal working hours. Noise preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to be employed. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

18.6 Heritage Resources

18.6.1 Potential Impacts

Archaeology

The pre-colonial landscape of Varkens Bay is highly modified and there no record of or evidence for archaeological sites or material at or in the vicinity of the ship repair facility. The slipway and lead-in jetties of the ship repair facility were constructed on the seabed and the side-slip areas on land reclaimed from the sea so their potential for intersecting archaeological material is very low.

The construction of the seawall in 1895 resulted in the burial of the dunes surrounding Varkens Bay under the fill behind the wall. The current administration buildings were erected on this fill and there is some potential for the presence of pre-colonial archaeological sites or material under the existing administration buildings, although this potential is likely to very low.

The excavation of foundations for the buildings proposed to replace the existing administration buildings may intersect buried historical dunes and archaeological sites or material they contain, although this is assessed to be very unlikely. It is also unlikely that the demolition of the lead-in jetties and the replacement of the submerged section of the slipway will have an impact on archaeological material. The extent of potential impacts will be limited to the footprint of the excavations and works.

Palaeontology

There is no evidence of any palaeontological occurrences at or in the immediate vicinity of the ship repair facility.

Impacts on palaeontological resources are not expected and an impact assessment table for palaeontology has not been created.

Built Environment

The ship repair facility is comprises a collection of related buildings and structures, most of which are more than 60 years of age and thus protected by the NHRA. It appears from this study that the lead-in jetties are less than 60 years of age and they have thus been omitted from the impact assessment below.

The heritage significance of the various elements of the ship repair facility is assessed to be mainly local (Grade 3C).

The impacts of the proposed upgrade include:

- the demolition of the administration buildings and submerged portion of the slipway;
- the alteration or the repair of the slipway above the waterline and side-slip areas; and
- the replacement of winch machinery and ship cradle.

In all cases the extent of potential impacts will be limited to the footprint of the proposed upgrade works.

Cultural Landscape

Cultural landscapes are highly sensitive to cumulative impacts and development activities that change the character and public memory of a place.

Although the proposed upgrade of the ship repair system will result in the replacement of or changes to individual elements of the facility, the overall integrity of the facility, as a part of and contributor to the evolving cultural landscape of the port is unlikely to be greatly affected by the proposed works. The impacts of the proposed upgrade work will be limited to the footprints of the various elements of the ship repair facility. The upgrade will ensure that the ship repair facility continues to contribute as a working element of an active harbour.

18.6.2 Impact Assessment

This section discusses the impacts identified by the Heritage Specialist and extracted from the Heritage Impact Assessment (**Appendix 6B**).

Archaeology

Potential impacts on heritage aspects:	Archaeology
Nature of impact:	Impact on buried pre-colonial archaeological sites and/or materials
Extent of impact:	Local
Duration of impact:	Permanent
Probability of occurrence:	Unlikely
Degree to which the impact can be reversed:	Irreversible, but effects can be mitigated
Degree to which the impact may cause irreplaceable loss of resources:	Medium to low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Archaeological monitoring and/or implementation of a reporting protocol during groundworks will ensure that should any archaeological material is encountered it can be recorded and recovered.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Built Environment (Demolition of administration buildings and submerged portion of the slipway)

Potential impacts on heritage aspects:	Administration buildings and submerged portion of the slipway
Nature of impact:	Destruction of historical structures older than 60 years of age
Extent of impact:	Local
Duration of impact:	Permanent
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> - Design of proposed new administration buildings should respond to and reflect the heritage indicators of the buildings to be demolished – for example, height, massing and industrial nature; - Reconstruction of submerged portion of slipway and the integration of the new structure with the surviving slipway above the waterline.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Built Environment (Alteration or repair of slipway above the waterline and side-slip areas)

Potential impacts on heritage aspects:	Slipway above the waterline and side-slip areas
Nature of impact:	Alteration and potential loss of historic fabric older than 60 years of age
Extent of impact:	Local
Duration of impact:	Permanent
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Repair of existing historic fabric will ensure the facility can return to full operational usefulness, which will ensure its long-term survival
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Built Environment (Replacement of winch machinery and ship cradle)

Potential impacts on heritage aspects:	Winch machinery and ship cradle
Nature of impact:	Loss of historic features older than 60 years of age
Extent of impact:	Local
Duration of impact:	Permanent
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Existing ship cradle and winch machinery recorded and then displayed on site or offered to a suitable local museum after removal.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Cultural Landscape

Potential impacts on heritage aspects:	Cultural landscape
Nature of impact:	Impact on evolving cultural landscape of the Port of Mossel Bay
Extent of impact:	Local
Duration of impact:	Permanent
Probability of occurrence:	Possible
Degree to which the impact can be reversed:	<ul style="list-style-type: none"> - Partly reversible through the design of the new buildings and structures to fit with the existing - Where not reversible the retention of a working ship repair facility will contribute to the evolving landscape of the port
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	The design of the new administration building that responds to surrounding and local heritage indicators
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

18.7 Transportation

18.7.1 Potential Impacts

During the construction period, there will be an increase in traffic on the local road networks due to the delivery of plant and material, transportation of staff and normal construction-related traffic.

As part of the construction phase, measures will be implemented for the selective upgrade of the roads (if necessary) and to render these roads safe for other users (amongst others). After the construction phase, the local roads will only need to be used for operation and maintenance purposes.

There will be an increase in traffic of vessels using the facility during the operation phase. All the appropriate traffic safety measures and control must be implemented to minimise any potential impacts. Any disruptions to the transportation network must be mitigated, and will be implemented in the EMP.

18.7.2 Impact Assessment

Transportation							
Project Life-cycle:	Construction						
Potential Impact:	<ul style="list-style-type: none"> Inadequate road conditions Disruptions to existing road users 						
Proposed Mitigation:	<ul style="list-style-type: none"> Site layout must clearly indicate parking areas for the construction vehicles. Construction vehicles should not be parked on public road access. Speed limit of 40km/h on roads within the project area to be adhered to. Access roads to be maintained in a suitable condition. Suitable erosion protective measures to be implemented for access roads during the construction phase. Traffic safety measures (e.g. traffic warning signs, flagmen) to be implemented. Clearly demarcate all access roads. Clearly mark pedestrian-safe access routes. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Low	Short	Likely	1	-6
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

Transportation							
Project Life-cycle:	Operation						
Potential Impact:	<ul style="list-style-type: none"> Increase in marine traffic 						
Proposed Mitigation:	<ul style="list-style-type: none"> TNPA to manage the amount of vessels entering and using the Port for ship repairs. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Low	Short	Likely	1	-6
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

18.8 Aesthetic Quality

18.8.1 Potential Impacts

Potential visual impacts during the construction phase of the powerline will be caused by poor placement of the construction camp and equipment, as well as poor management of rubble, refuse and construction material on site. Additionally, destruction of the surrounding natural environment would decrease the aesthetic appeal of the area. Thus, the visual impacts should be minimised.

18.8.2 Impact Assessment

Aesthetic Quality							
Project Life-cycle:	Construction						
Potential Impact:	<ul style="list-style-type: none"> Reduction in visual quality due to construction activities 						
Proposed Mitigation:	<ul style="list-style-type: none"> On-going housekeeping to maintain a tidy construction area. Construction camp to be positioned to minimize its visual impacts. Damage to the natural environment should be minimised. No construction rubble, construction material, refuse, litter or any other material not found naturally in the surroundings should be allowed at any time to be lying around on the construction site. Particular aspects of concern to landowners and local residents should be addressed during construction. 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

Aesthetic Quality							
Project Life-cycle:	Operation						
Potential Impact:	<ul style="list-style-type: none"> Improvement in visual quality due to upgrade and modernisation of the facility 						
Proposed Mitigation:	<ul style="list-style-type: none"> TNPA to maintain the Port once upgraded Encourage tourism activities in the upgraded Port/Waterfront Development 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	+	Local	Medium	Short	Likely	2	+24
With Mitigation	+	Local	Medium	Short	Likely	3	+30

18.9 Existing Infrastructure

18.9.1 Potential Impacts

The purpose of the proposed development is to upgrade the existing ship repair facility and structures within the facility. Any services or structures that will not be upgraded as part of the development must not be damaged during the construction phase.

Where there is a risk of damage occurring, the contractor is to document to the condition prior to the start of work.

18.9.2 Impact Assessment

Existing Infrastructure							
Project Life-cycle:	Construction						
Potential Impact:	Damage to property						
Proposed Mitigation:	<ul style="list-style-type: none"> If a risk exists of damage taking place on the property as a result of construction, a condition survey should be undertaken prior to construction The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction work 						
	Nature	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

18.10 Cumulative Impacts

According to GN No. R. 982 of the amended EIA Regulations (07 April 2017), a “**cumulative impact**”, in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

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.

The following cumulative impacts are anticipated:

- Decreased water quality;
- Increased litter in the marine environment; and
- Disturbance of avifauna.

Cumulative Impacts							
Potential Impact:	Decreased water quality in Mossel Bay Port due to poor construction practices which negatively impact water quality.						
Proposed Mitigation:	The cumulative impact to water quality is thus thought to be low should the proposed mitigation measures from the Marine Environment Impact Assessment be implemented, including the water quality monitoring programme.						
	Nature +/-	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Unlikely	1	-4
Potential Impact:	Increased litter in the marine environment						
Proposed Mitigation:	<ul style="list-style-type: none"> Ensure proper storage of material (including fuel, paint) that could cause water pollution. Ensure all mitigation measures recommended by the Marine Environment Impact Assessment for “Pollution and waste” are implemented. 						
	Nature +/-	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Medium	Short	Likely	2	-24
With Mitigation	-	Local	Low	Short	Unlikely	1	-4
Potential Impact:	Disturbance of avifauna: The cumulative impact of the proposed development is unlikely to be significant for the following reasons: <ul style="list-style-type: none"> The proposed development does not impact on the available habitat; and 						

Proposed Mitigation:	<ul style="list-style-type: none"> The proposed development does not change or alter the existing land use at the Mossel Bay Port. Based on the above, it is believed that the disturbance to avifauna will not be significant should the mitigation measures included in the EMP be implemented. 						
	Nature +/-	Extent	Magnitude	Duration	Probability	Significance	Score
Without Mitigation	-	Local	Low	Short	Likely	1	-6
With Mitigation	-	Local	Low	Short	Unlikely	1	-4

19 ANALYSIS OF ALTERNATIVES

Alternatives are the different ways in which the project can be executed to ultimately achieve its objectives. Examples could include carrying out a different type of action, choosing an alternative location or adopting a different technology or design for the project. By conducting the comparative analysis, the BPEOs can be selected with technical and environmental justification. Münster (2005) defines BPEO as the alternative that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”.

19.1 No-go Alternative

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives.

Vessels based at the Port of Mossel Bay will have to continue to sail to other ports for repair and maintenance. Not only is this costly for fisherman but it will continue to have significant reputational damage to the TNPA. The progressive deterioration of the facility will result in the decommissioning and demolition of the assets of this facility as it is currently unsafe and cannot be utilised.

19.2 Comparative Analysis of Alternatives based on Impact Assessment

Table 21 summarises and compares the findings of the various relevant specialists in terms of their respective preferences for the project alternatives based on the outcome of the impact assessment.

Table 21: Summary of the preferred options

Environmental Feature/Attribute	Alternatives	
	Option 1	Option 2
Marine Environment Impact Assessment	X	
Heritage Impact Assessment	X	
Overall Environmental Impact	X	
Technical Team	X	

19.3 Best Practicable Environmental Option (BPEO)

The Marine Environment Impact Assessment preferred Alternative 1, which is to repair the existing slipway. There will be less impact on the marine environment for Alternative 1 as the underwater portion of the rail support beams for the cradle will be rebuilt and not completely demolished. Demolishing the underwater slipway will result in a greater impact on the marine habitat, as considerable construction activity will be required. Impacts on the marine habitat will mainly be during the construction period but are reduced by applying mitigation measures. Just by repairing the stormwater management structure and adding a recycling system above ground will significantly reduce stormwater runoff of contaminants during the operational phase.

The Heritage Impact Assessment preferred Alternative 1 (the repair and partial rebuilding of the existing slipway) as the best option with respect to the slipway. The choice of Alternative 1 will help to balance the anticipated impacts of the proposed upgrade on the historic fabric against the long-term benefits to the survival of this historic facility and the operational health of the port that the upgrade will bring.

Based on the recommendations of the specialists, technical considerations and the comparison of the impacts associated with the two options, Option 1 was selected. Even though both alternative options have similar impacts during construction, Alternative Option 2 has a greater extent of impacts because of the complete demolition and replacement of the slipway (above and under water). Option 2 is also an extremely expensive and time consuming option. Therefore Alternative 1 is proposed.

20 CONCLUSIONS AND RECOMMENDATIONS

20.1 Environmental Impact Statement

Due to a lack of maintenance and an incident that occurred in 2005, the ship repair facility at the Port of Mossel Bay has become unsafe and the permissible maximum vessel light displacement has been reduced from 500 Tons to 200 Tons. The lead-in jetties are also in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties. There is also an operations building on the site that was constructed at the same time as the slipway. The building is old, of outdated construction and does not meet the Port's future operational requirements.

The proposed upgrade of the ship repair facility will meet the objectives of the National Government initiative called Operation Phakisa which is linked to the National Development Plan and will allow the facility to become safe and operational thus allowing the following benefits:

- Alignment with Ports Act and other statutory requirements;
- Contributing towards the planned Waterfront Development of the Mossel Bay Port;
- Provide technical skills improvement and widening ship repair and support services that can be offered by the Port;
- Stimulate local and regional supply chain opportunities due to increased vessel handling and increasing the volume of vessels handled per year and increasing the size of vessels that can be handled.

Based on the location and nature of the proposed development, the following environmental specialist studies were conducted:

1. Marine Environment Assessment Report; and
2. Phase 1 Heritage Impact Assessment.

Alternative 1 was recommended as the BPEO as it had the least overall environmental impacts: Repair the existing concrete beam structures above and below water and replace all rails and fixing elements.

Critical environmental activities that need to be executed during the project life-cycle include the following:

- Pre-construction Phase
 - Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation;
 - Permits for heritage resources to be impacted on;
 - On-going consultation with IAPs; and
 - Other activities as per EMPr;
- Construction Phase
 - Diligent compliance monitoring of the EMPr, EA and other relevant environmental legislation;
 - Reinstatement and rehabilitation of construction domain;
 - On-going consultation with IAPs; and
 - Other activities as per EMPr;
- Operational Phase
 - Implement water quality monitoring programme;
 - Routine maintenance and inspections of the Port of Mossel Bay;
 - Implement pollution control measures; and
 - On-going consultation with IAPs.

With the selection of the BPEO, the adoption of the mitigation measures include in the BAR and the dedicated implementation of the EMPr, it is believed that the significant environmental aspects and impacts associated with this project can be suitably mitigated. With the aforementioned in mind, it can be concluded that there are no fatal flaws associated with the project and that authorisation can be issued, based on the findings of the specialists and the

impact assessment, through the compliance with the identified environmental management provisions.

20.2 Recommendations

The following key recommendations, which may also influence the conditions of the EA (where relevant), accompany the BAR for the proposed upgrade of the ship repair facility in Mossel Bay:

1. Where relevant, the construction domain needs to be contained within the site footprint as much as possible to avoid disturbance outside of the project footprint.
2. As discussed in the EMPr, various forms of monitoring are required to ensure that the receiving environment is suitably safeguarded against the identified potential impacts, and to ensure that the environmental management requirements are adequately implemented and adhered to during the execution of the project. The types of monitoring to be undertaken include:
 - a. Continue the Long-Term Ecological Monitoring Programme implemented by TNPA for the Port of Mossel Bay that is being undertaken by the CSIR; and
 - b. Compliance Monitoring for the Independent ECO to monitor compliance against the EMPr and EA.
3. All mitigation measures in the Marine Environment Impact Assessment (**Appendix 6A**) must be included in the EMPr for implementation by TNPA.
4. Pertinent recommendations from the Heritage Impact Assessment (**Appendix 6B**) include:
 - a. A permit to demolish and rebuild the submerged portion of the slipway will be required from SAHRA because all built structures older than 60 years of age are protected by the NHRA. It is recommended that the required application for permission to repair and upgrade the slipway and side-slip areas above the waterline is also made to SAHRA. This will ensure that the works related to the marine aspects of the upgrade are dealt with by a single heritage agency.
 - b. An application will need to be made to Heritage Western Cape for the demolition of the administration buildings.
 - c. A protocol for reporting palaeontological finds should be commissioned from a suitably qualified palaeontologist and implemented during all intrusive ground works.
 - d. It is recommended that the existing ship cradle and winch house machinery that is to be removed is recorded before removal and is then either offered to a suitable local museum or that provision is made for its retention and display at the ship repair facility.
 - e. Although the historical seawall will not be affected by the proposed upgrade care must be taken in both the design and construction of the new administration

building and in work related to other elements of the upgrade that the wall is not compromised or damaged in any way.

- f. No archaeological mitigation is recommended but in the event of human remains being uncovered during work, all activities in the vicinity must cease until a suitably qualified archaeologist and SAHRA and Heritage Western Cape have been notified, the significance of the material has been assessed and a decision has been taken as to how to deal with it.

21 OATH OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

I (name and surname) _____
Of (address) _____
ID No. _____ Contact No. _____

I hereby make an oath and state that:

In accordance with Appendix 1 of Government Notice No. R. 982 of the amended 2014 EIA Regulations (07 April 2017), this serves as an affirmation by the Environmental Assessment Practitioner (EAP) in relation to:

Section 1(j) -

- 1. The correctness of the information provided in this report(s);*
- 2. The inclusion of comments and inputs from stakeholders and interested and affected parties;*
- 3. The inclusion of inputs and recommendations from the specialist reports where relevant; and*
- 4. 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 1(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.*

Signature _____ Date: _____

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