



PERFORMANCE AUDIT REPORT ON COASTAL MANAGEMENT

WITHIN THE MINISTRY OF ENVIRONMENT AND TOURISM and other key stakeholders

FOR THE FINANCIAL YEARS ENDED 2013/14 to 2015/16

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TO THE HONOURABLE SPEAKER OF THE NATIONAL ASSEMBLY

I have the honour to submit herewith my performance audit report on the audit report on Coastal Management within the Ministry of Environment and Tourism for the financial years ended 2013/14 to 2015/16 in terms of Article 127(2) of the Namibian Constitution. The report is transmitted to the Honourable Minister of Finance in terms of Section 27(1) of the State Finance Act, 1991, (Act 31 of 1991) to be laid upon the Table of the National Assembly in terms of Section 27(4) of the Act.

A handwritten signature in black ink, appearing to read 'Junias Etuna Kandjeke'.

JUNIAS ETUNA KANDJEKE
AUDITOR-GENERAL

WINDHOEK, APRIL 2018

Table of Contents

LIST OF PICTURES.....iv

LIST OF ACRONYMSv

GLOSSARY OF TERMSvi

EXECUTIVE SUMMARYvii

CHAPTER ONE1

1.1 INTRODUCTION.....1

1.2 MOTIVATION1

1.3 THE MANDATE, VISION AND MISSION STATEMENT.....2

1.3.1 The Ministry of Environment and Tourism2

Mandate.....2

Vision 2

Mission Statement.....3

1.4 ORGANIZATIONAL STRUCTURE.....3

1.5 FINANCING5

1.6 STAFFING5

CHAPTER TWO: AUDIT DESIGN.....6

2.1 AUDIT SCOPE.....6

2.2 AREAS OF COVERAGE6

2.2.1 Audit Objective6

2.2.2 Geographical Coverage6

2.3 Audit Limitation.....6

2.4 Assessment criteria; audit questions and methodology6

3. Sampling.....6

3.1 Physical Observations.....6

3.2 Documentary Reviews.....6

CHAPTER THREE: DESCRIPTION OF THE AUDIT AREA.....7

3 SYSTEM DESCRIPTION7

3.1 Ministry of Environment and Tourism7

3.2 Ministry of Works and Transport.....7

3.3 Namibian Ports Authority7

3.4 Ministry of Agriculture, Water and Forestry7

3.5	Ministry of Mines and Energy	7
3.6	Ministry of Fisheries and Marine Resources	8
3.7	Local Authorities in Coastal Areas.....	8
3.8	Roles and responsibilities of key players.....	8
3.8.1	Ministry of Environment and Tourism	8
3.8.1.1	The Minister.....	8
3.8.1.2	The Environmental Commissioner	8
3.8.1.3	Conservation Scientists/Environmental Officers/Inspectors.....	9
3.8.1.4	Chief Control Warden	9
3.8.1.4.1	Chief Warden	10
3.8.1.5	Warden.....	10
3.8.2	Ministry of Works and Transport.....	10
3.8.2.1	Powers of Proper Officers or Surveyor.....	10
3.8.3	Namibia Ports Authority.....	10
3.8.3.1	Safety, Health, Risk, Environment and Quality Officer	10
3.8.4	Ministry of Agriculture, Water and Forestry	11
3.8.4.1	Hydrologist	11
3.8.5.3	Petroleum Inspector.....	12
3.8.6	Ministry of Fisheries and Marine Resources	13
3.9	PROCESS DESCRIPTION	13
3.9.1	Overall Coastal Management.....	13
3.9.1.1	Laws and Regulations.....	14
3.9.2	Climate Change.....	14
3.9.3	Coastal Monitoring and Enforcement of Laws and Regulations.....	15
3.9.3.2	Environmental Clearance Certificate.....	15
3.9.3.4	Verification of Inspections on Registered Ships	16
3.9.3.5	Inspection on Licensed ships	16
3.9.3.6	Inspections on Foreign ships.....	17
3.9.3.7	Inspections on Mining Vessels.....	17
3.9.3.8	Inspections at Petroleum Exploration Operations	18
3.9.3.9	Monitoring Compliance of Sea Water Abstraction	19
3.9.3.10	Monitoring Compliance of Effluent Disposal into the Sea	19
3.9.4	Coastal Pollution and Degradation.....	20

3.9.4.1 Control of Pollution into the sea	20
3.9.4.2 Pollution Control and Monitoring at the Port	21
3.9.4.3 Waste Management at Coastal Local Authorities	21
3.9.4.4 Degradation at Protected Areas.....	22
3.9.4.5 Control of Pollution into Coastal Rivers.....	22
CHAPTER FOUR: FINDINGS	23
4.1 Overall Coastal Management.....	23
4.1.1 Laws and Regulations.....	23
4.2 Climate Change.....	24
4.3 Coastal Monitoring and Enforcement of laws and regulations	27
4.3.1 Environmental Management Plans.....	27
4.3.2 Environmental Clearance Certificates	27
4.3.3 Monitoring Human Impact in Coastal National Park	28
4.3.4 Verification of Inspection on registered Ships.....	29
4.3.5 Inspection on Licensed Ships.....	29
4.3.6 Inspection on Foreign Ships.....	30
4.3.8 Inspections at Petroleum Exploration Operations	31
4.3.9 Compliance Monitoring of Sea Water Abstraction	31
4.3.10 Compliance Monitoring of Effluent Disposal into the Sea.....	31
4.4 Coastal Pollution and Degradation.....	32
4.4.2 Pollution Control at the Port	33
4.4.3 Waste Management at Coastal Local Authorities	34
4.4.4 Degradation at Protected Area	34
CHAPTER 5: CONCLUSIONS.....	37
CHAPTER 6: RECOMMENDATIONS.....	39
APPENDIX I: ORGANIZATIONAL STRUCTURE OF THE MET	38
APPENDIX II: ASSESSMENT CRITERIA; AUDIT QUESTIONS AND METHODOLOGY	39
APPENDIX III: PHYSICAL OBSERVATIONS CONDUCTED.....	57
LAWS AND REGULATIONS	69
UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS	69

LIST OF TABLES

Table 1: Budget allocation for the Department of Environmental Affairs.....	4
Table 2: Budget allocation for the Department of Parks and Wildlife Management.....	4
Table 3: Staff compliment for the Department of Environmental Affairs.....	5
Table 4: Staff compliment for the Department of Parks and Wildlife Management.....	5
Table 5: Verification of inspection for calendar years 2013-2015.....	28
Table 6: Inspections conducted on foreign ships.....	29

LIST OF PICTURES

Picture 1: Infrastructure build close to the sea at Swakopmund	26
Picture 2: Infrastructure build close to the sea at Henties Bay and Luderitz respectively.....	26
Picture 3: Brine disposed into the sea by the Salt Company (Pty) Ltd.....	31
Picture 4: Oil spills and no drip trays for oil drums at NAMPORT.....	32
Picture 5: Unbanded oil container at Walvis Bay and wastes burned at Luderitz dumpsite.....	32
Picture 6: Oil spills on the beds of the Swakop and Omaruru Rivers respectively.....	33
Picture 7: Abandoned trucks and developments in and along the Omaruru River.....	34

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LIST OF ACRONYMS

ABBREVIATION	DEFINITION
AFROSAI-E	African Organization of Supreme Audit Institutions English Speaking Countries
AMIS	Abuja Memorandum of Understanding Information System
DEA	Department of Environmental Affairs
DNP	Dorob National Park
DM	Directorate of Mines
DMA	Directorate of Maritime Affairs
DPWM	Department of Parks and Wildlife Management
DWAF	Directorate of Water Affairs and Forestry
ECC	Environmental Clearance Certificate
EMP	Environmental Management Plan
GDP	Gross Domestic Product
LA	Local Authority
MARPOL	International Convention for the Prevention of pollution from Ships
MAWF	Ministry of Agriculture, Water & Forestry
MET	Ministry of Environment & Tourism
MME	Ministry of Mines and Energy
MFMR	Ministry of Fisheries and Marine Resources
MOU	Memorandum of Understanding
MWT	Ministry of Works and Transport
NAMDEB	Namibian Diamond Corporation
NAMPORT	Namibia Ports Authority
NDP's	National Development Plans
SDGs	Sustainable Development Goals
SHREQ	Safety, Health, Risk, Environment and Quality
UN	United Nations
WAP	Water Abstraction Permit
WWEDEP	Waste Water Effluent Disposal Exemption Permit

GLOSSARY OF TERMS

Brine: means wastewater from salt mining operations.

Bunkering Operations means the supply of fuel for use by ships in a seaport.

Environmental Clearance Certificate: means an Environmental Clearance Certificate issued in terms of section 34 or 37 of the Environmental Management Act, 2007, (Act No.7 of 2007), authorizing a listed activity to be undertaken at the coast which includes mining, fishing, tourism and coastal local authorities.

Environmental Management Plan: means a tool to ensure that undue or reasonably avoidable adverse impacts of the construction, operations and decommissioning of a project are prevented, and that the positive benefits of the project are enhanced.

Effluent: liquid waste or sewage discharged into a river or the sea.

Government: means Government of the Republic of Namibia.

Integrated and Cooperative Coastal Governance: a continuous and dynamic process that unites Government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources.

Listed Activity: means fishing, mining, tourism and coastal Local Authorities operations which impacts the environment and should not be undertaken without an Environmental Clearance Certificate.

Organ of State: means any office, ministry or agency of State or administration in the local or regional spheres of government; or

(b) any other functionary or institution-

(i) exercising a power or performing a function in terms of the Namibian Constitution; or

(ii) exercising a public power or performing a public function in terms of any law, but does not include a court or a judicial officer.

Proponent: means a person who proposes to undertake a listed activity.

Sustainable Development: means human use of natural resources, whether renewable or non-renewable, or the environment, in such a manner that it may equitably yield the greatest benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations including the maintenance and improvement of the capacity of the environment to produce renewable resources and natural capacity for regeneration of such resources.

United Nations Sustainable Development Goals: means a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

EXECUTIVE SUMMARY

The Office of the Auditor-General is authorized to carry out performance audits in terms of Section 26(1)(b)(iv) of the State Finance Act, 1991 (Act 31 of 1991) which reads as follows: (The Auditor-General) *“may investigate whether any moneys in question have been expended in an efficient, effective and economic manner”*.

Furthermore, Section 26(3) of the State Finance Act authorised the Office of the Auditor-General to carry out special audits of which environmental audit is one.

The purpose of the audit report is to assess whether the Ministry of Environment and Tourism and key stakeholders are effective in coastal management in terms of monitoring and enforcement of laws and regulations concerning climate change; coastal pollutions and degradation at the protected areas and coastal towns in Namibia.

The Division of Environmental Assessment, Waste Management, Pollution Control and Inspection and the Division of Multilateral Environmental Agreements under the Department of Environmental Affairs and the Department of Natural Resources, Parks and Regional Services, under the (MET) is responsible for monitoring and enforcement of laws and regulations at protected areas and coastal towns in Namibia.

The major findings, conclusions and recommendations identified during the audit are as follows:

Major Findings

Overall Coastal Management

- ❖ A sectoral approach is currently used in Namibia to manage the coastal areas.
- ❖ The current laws and regulations have shortcomings that will prevent the MET and key stakeholders from implementing the United Nations Sustainable Development Goals (SDGs).

Climate Change

- ❖ All coastal local authorities could not provide evidence that they have implemented climate change adaptation measures for existing and future infrastructural development close to the sea, which might be at risk to beach erosion and washed away by strong tides and sea level rises.
- ❖ The Directorate of Resource Management under the Ministry of Fisheries and Marine Resources could not provide assurance to the audit that the impacts of climate change on the marine ecosystems were identified.

Coastal Monitoring and Enforcement of laws and regulations

- ❖ The Department of Environmental Affairs (DEA) under Ministry of Environment and Tourism (MET) did not conduct complete inspections to ensure compliance to Environmental Management Plans (EMP) of Proponents and Organs of State operating at the Namibian coast.
- ❖ The DEA under MET did not ensure that the listed activities indicated in paragraph 4.3.2 undertaken by proponents and Organs of State operating at the coast have an Environmental Clearance Certificate (ECC).
- ❖ Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) did not verify inspections conducted on fishing and mining registered ships by Private Ship Surveyors.
- ❖ The DMA only conducted 116 inspections of 3007 foreign ships that visited the Namibian ports.
- ❖ Directorate of Mines under the Ministry of Mines and Energy (MME) did not conduct inspections on mining vessels as planned and could also not provide evidence that the deficiencies found during inspections were rectified.
- ❖ Department of Water Affairs and Forestry (DWAF) under the Ministry of Agriculture, Water and Forestry (MAWF) could not provide assurance to the audit that it effectively ensured compliance to the Sea Water Abstraction Permit conditions.
- ❖ DWAF procedure of determining the quality of effluent disposed into the sea is inconsistently applied in comparison to the water quality assessment stipulated by the Waste Water Effluent Disposal Exemption Permit (WWEDEP).

Coastal Pollution and Degradation

- ❖ DWA issued Waste Water Effluent Disposal Exemption Permit to NAMDEB to dispose sewage into the sea without complying with the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962.
- ❖ Environmental incidents caused by tenants reoccur at the ports although NAMPORT conducts inspections.
- ❖ Swakopmund and Henties Bay Municipalities and Oranjemund Town Council did not develop waste management regulations, while Walvis Bay and Luderitz Town Councils do not adhere to their own regulations.
- ❖ The Department of Natural Resources, Parks and Regional Service (DNRPRS) under MET did not fence-off and erect signs indicating the location of the Dorob National Park along the road between Swakopmund and Arandis to avoid unauthorized entry by the public.
- ❖ The DEA under the Ministry of Environment and Tourism and DWAF under the Ministry of Agriculture, Water and Forestry respectively did not control the activities of sand miners in the Swakop and Omaruru rivers.

Conclusions

The Ministry of Environment and Tourism (MET) and key stakeholders are currently applying a fragmented sectoral approach to manage the coast in Namibia.

MET and key stakeholders are not ready to implement the United Nations (UN) Sustainable Development Goals (SDGs) related to coastal management due to shortcoming in the existing laws and regulations.

Coastal local authorities did not provide evidence that climate change adaptation measures are implemented for existing and future infrastructural development close to the sea.

The Directorate Resource Management under the Ministry of Fisheries and Marine Resources (MFMR) did not provide evidence that measures were put in place for the impacts of climate change on the marine ecosystem.

The Department of Environmental Affairs (DEA) under MET did not ensure compliance Environmental Management Plans of proponents and organs of state at the coast.

The DEA under MET did not ensure that listed activities as stated in paragraph 4.3.2 undertaken by proponents and organs of state at the coast are operating with Environmental Clearance Certificates (ECC's).

The Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) did not effectively verify the inspections conducted by Private ship Surveyors on fishing and mining registered ships.

The DMA did not effectively inspect foreign ships that visited the Namibian ports.

The Directorate of Mines (DM) under the Ministry of Mines and Energy (MME) could not provide evidence that the deficiencies found during inspections were rectified by mining ships before departure to the sea.

The Department of Water Affairs and Forestry (DWAF) under the Ministry of Agriculture, Water and Forestry (MAWF) did not ensure compliance with Sea Water Abstraction Permit conditions.

The DWAF did not develop sea water quality standards for effluent disposal into the sea to avoid inconsistently measuring the effluent quality disposed into the sea.

DWAF issued WVEDEP to a mining company to dispose sewage into the sea without complying with the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962.

Environmental incidents caused by tenants reoccur at the ports although NAMPORT conducts inspections.

Swakopmund and Henties Bay Municipalities and Oranjemund Town Council have no waste management regulations.

Walvis Bay and Luderitz Town Councils did not comply with their own waste management regulations.

The Directorate of Parks and Wildlife Management under MET did not fence off and erect signs indicating the location of the Dorob National Park along the road between Swakopmund and Arandis.

DEA under MET and DWAF under MAWF did not control sand mining activities in the Swakop and Omaruru Rivers to prevent degradation.

Recommendations

The Ministry of Environment and Tourism (MET) and key stakeholders should put measures in place to allow for an integrated sectoral approach to coastal management.

The MET and key stakeholders should put measures in place to address shortcomings within existing laws and regulations related to the coastal management to ensure the effective implementation of the United Nations (UN) Sustainable Development Goals (SDGs).

Coastal local authorities should put measures in place to ensure the implementation of climate change adaptation measures for existing and future infrastructural development close to the sea.

The Directorate of Resource Management (DRM) under the Ministry of Fisheries and Marine Resources (MFMR) should conduct research to determine the impacts of climate change on the marine ecosystem and put measures in place to respond to the impacts thereof.

The Department of Environmental Affairs (DEA) under MET should put measures in place to ensure Proponents and Organs of State at the coast effectively comply with Environmental Management Plans.

The DEA under MET should put measures in place to ensure that Proponents and Organs of State undertaking listed activities at the coast operate with Environmental Clearance Certificates (ECC).

The Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) should put measures to effectively verify the inspections conducted by private ship surveyors on fishing and mining registered ships.

The DMA under MWT should also put measures in place to ensure foreign ships are effectively inspected.

The Directorate of Mines (DM) under the Ministry of Mines and Energy (MME) should put measures in place to ensure that deficiencies are rectified by mining ships before departure to the sea.

The Department of Water Affairs and Forestry (DWAF) under the Ministry of Agriculture, Water and Forestry (MAWF) should put measures in place to ensure compliance with Sea Water Abstraction Permit conditions.

The DWAF should put measures in place to develop sea water quality standards for effluent disposal into the sea.

DWAF should put measures in place to ensure that mining companies comply with the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962 for sewage disposal into the sea before issuing the WVEDEP.

Namibian Ports Authority (NAMPORT) should put measures in place that will ensure that inspections conducted by them prevent the re-occurrence of environmental incidents caused by tenants.

Swakopmund Municipality, Henties Bay Municipality and Oranjemund Town Council should develop their own waste management regulations.

Walvis Bay and Luderitz Town Council should comply with their own waste management regulations.

The Directorate of Parks and Wildlife Management under MET should put measures in place that will enable them to fence off and erect signs indicating the location of the Dorob National Park along the road between Swakopmund and Arandis.

DEA under MET and DWAF under MAWF should put measures in place to control sand mining activities in the Swakop and Omaruru Rivers.

CHAPTER ONE

1.1 INTRODUCTION

According to the National Policy on Coastal Management for Namibia, “Namibia’s coastline extends some 1570 km, from the mouth of the Orange River on the South African border, to the mouth of the Kunene River on the Angolan border.” The Namibian coastal areas boost the longest protected area network in Africa comprised of the Skeleton Coast Park, Dorob National Park, Namib-Naukluft Park and Sperrgebiet National Park.

Coastal management is a process of balancing social, economic and environmental activities without compromising on the quality of life of human community which depends on coastal resources while maintaining the biological biodiversity and productivity of coastal ecosystems.

Fishing, mining and tourism are major activities taking place at the coastline of Namibia and contribute significantly to the Gross Domestic Product (GDP) of the country. According to the Namibian 5th National Development Plan for 2017/18-2021/22, the fishing, mining and tourism sectors contributed 15%, 12% and 1.8% respectively to the Namibian economy during 2016.

However, the growing economic development and human activities along the coast are leading to rapid migration, bringing with it uncontrolled urban development that results in overuse and land base pollution, an increase in industrial coastal and marine pollution and degradation of water regimes for coastal wetlands.

Furthermore, apart from the impacts of human activities, Namibia is not exempted from the impacts of climate change. The National Climate Change Strategy & Action Plan of Namibia 2013-2020 adopted by the Ministry of Environment and Tourism (MET) projected sea level rise between Walvis Bay and Henties Bay. It further states that infrastructural development along the coast might be washed away by strong tides and therefore important for Namibia to adapt climate change measures as set out in goal 13 of the 2030 United Nations Agenda for Sustainable Development adopted in September 2015.

In the light of the above, MET and other key stakeholders which includes Ministry of Agriculture, Water and Forestry (MAWF), Ministry of Mines and Energy (MME), Ministry of Urban and Rural Development (MURD), Ministry of Works and Transport (MWT) and Namibian Ports Authority (NAMPORT) is tasked with the responsibility to respond to the threats caused by various land and sea use activities through effective Coastal Management.

1.2 MOTIVATION

The audit was motivated by problem indicators identified during the preliminary phase in terms of the following:

- Inadequate monitoring of land and sea use activities by the MET and key stakeholders which is a threat to coastal biodiversity;
- Lack of integrated coastal management by the MET and key stakeholders;
- Fishing factories at Walvis Bay operating without Environmental Clearance Certificates;

- Lack of coastal management legislation; and
- Inadequate reception facilities at NAMPORT.

Furthermore, in addition to the problem indicators stated above, the audit also assessed the Overall Coastal Management and Climate Change Adaptation Strategies implemented by the MET because SAI Namibia as an affiliate of the African Organization of Supreme Audit Institutions for English Speaking Countries (AFROSAI-E) participates in a collaborative audit on Coastal Management together with other countries such as Tanzania, Mauritius, Seychelles, Liberia, Sudan and Nigeria.

1.3 THE MANDATE, VISION AND MISSION STATEMENT

1.3.1 The Ministry of Environment and Tourism

Mandate

“The mandate of the Ministry is derived from a constitutional provision, Chapter 11 of the Principles of State Policy, Article 95: Promotion of the Welfare of the People.

The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following:

Maintenance of the ecosystem, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory.”

Vision

“To be a leader in the conservation and tourism development through innovation and partnership.”

Mission Statement

“To promote biodiversity conservation in the Namibian environment through the sustainable utilization of natural resources and tourism development for the maximum social and economic benefits of the citizens.”

1.4 ORGANIZATIONAL STRUCTURE

The Minister heads the Ministry of Environment and Tourism (MET). The Permanent Secretary reports to the Minister and there are three Departments which are headed by a Commissioner and two Deputy Permanent Secretaries who report directly to the Permanent Secretary. Furthermore, under the Departments there are five Directors who report to the Deputy Permanent Secretaries and 16 Deputy Directors who report directly to Directors. The three Deputy Directors report to the Deputy Commissioner who reports to the Commissioner.

The three Departments are as follows: Environmental Affairs, Natural Resources, Parks and Regional Services; and Tourism Planning and Administration. *(See attached appendix I).*

The audit focused on two divisions namely, the Division of Environmental Assessment, Waste Management, Pollution Control and Inspection and the Division of Multilateral Environmental Agreements under the Department of Environmental Affairs and the Department of Natural Resources, Parks and Regional Services, under the MET respectively.

The main responsibilities of the divisions are as follows:

Division of Environmental Assessment, Waste Management, Pollution Control and Inspection

- “To receive and review Environmental Assessments and provide recommendations on the issuing of Environment Clearance Certificates;
- To promote the management of waste, hazardous substances and pollution in an environmentally sound manner; and
- To monitor and enforce Environmental Management Plans and general measures for environmental protection.”

Division of Multilateral Environmental Agreements

- “ Promote and support the implementation of all environmental policies and legislations related to biodiversity, sustainable land management and climate change”.
- Advise decision-makers accordingly on all matters related to biodiversity, sustainable land management and climate change-related programmes, plans and projects etc.”

Directorate of National Parks and Wildlife Management

- “ To conserve, care and control the utilization of all indigenous animal and plant life across the country;
- To control problem animals in and around all proclaimed parks and reserves and to provide advisory services to other areas;
- To administer and perform all required activities for the maintenance of proclaimed parks and reserves;
- To provide information and education services on wildlife issues; and
- To enforce all laws and regulations pertaining to conservation for the safe-guarding and preservation/recovery/rehabilitation and natural eco systems.”

1.5 FINANCING

The Ministry of Environment and Tourism

Below are the authorized and actual expenditure of the Department of Environmental Affairs:

Table 1: Budget allocation for the Department of Environmental Affairs:

Financial year	Authorized expenditure	Actual expenditure	Variance
	N\$	N\$	N\$
2013/14	83 853 000	79 602 180	4 250 820
2014/15	47 141 525	46 300 975	840 550
2015/16	37 982 337	36 733 032	1 249 305

Source: Report of the Auditor-General on the accounts of the MET for the financial years ending 2013/14-2015/2016

Table 2: Budget allocation for the Department of Parks and Wildlife Management:

Financial year	Authorized expenditure	Actual expenditure	Variance
	N\$	N\$	N\$
2013/14	212 527 000	200 729 855	11 797 145
2014/15	238 066 463	237 071 808	994 655
2015/16	253 578 379	264 042 464	(10 464 085)

Source: Report of the Auditor-General on the accounts of the MET for the financial years ending 2013/14-2015/2016

1.6 STAFFING

The Ministry of Environment and Tourism

The staff complement for the period 2013/14-2016 for the Department of Environmental Affairs and Parks and Wildlife Management are as follows:

Table 3: Staff Complement for the Department of Environmental Affairs:

Financial Year	Staff Establishment	Filled Positions	Vacant Positions	% Post Vacant
2013/14	38	9	29	76
2014/15	38	9	29	76
2015/16	37	21	16	43

Source: Staffing figures were extracted from the budget book 2013/14-2015/2016

Table 4: Staff Complement for the Department of Parks and Wildlife Management:

Financial Year	Staff Establishment	Filled Positions	Vacant Positions	% Post Vacant
2013/14	1068	850	218	20
2014/15	1068	850	218	20
2015/16	1154	909	245	21

Source: Staffing figures were extracted from the budget book 2013/14-2015/2016

CHAPTER TWO: AUDIT DESIGN

2.1 AUDIT SCOPE

The audit focused on Coastal Management by the Ministry of Environment and Tourism (MET) and key stakeholders¹ in terms of effectively monitoring and enforcing laws and regulations concerning climate change, and; coastal pollutions and degradation at the protected areas and coastal towns in Namibia.

2.2 AREAS OF COVERAGE

2.2.1 Audit Objective

To assess whether the Ministry of Environment and Tourism and key stakeholders are effective in coastal management in terms of monitoring and enforcement of laws and regulations concerning climate change, coastal pollutions and degradations at the protected areas and coastal towns in Namibia.

2.2.2 Geographical Coverage

Three regions namely Khomas where the head office is situated and Erongo and //Kharas which have coastal towns were visited during the main study. Three financial years were covered which are 2013/14-2015/16 in order to establish the trends as well as for comparison purposes.

2.3 Audit Limitation

The audit experienced limitation with regards to conducting physical observations at diamond and petroleum exploration mining vessels, marine protected areas and the Sperrgebiet National Park due to logistical challenges in the //Kharas region.

2.4 Assessment criteria; audit questions and methodology

See attached appendix II.

3. Sampling

3.1 Physical Observations

Stratified random sampling was applied to select fishing factories, mining sites, ports, and coastal rivers, infrastructural developments along the coast, desalination plant and coastal Local Authorities for physical observations. *(See attached appendix III)*

3.2 Documentary Reviews

Random sampling was applied to review documents. *(See attached appendix V)*

¹ Ministry of Works and Transport, Ministry of Mines and Energy, Ministry of Agriculture, Water and Forestry, Ministry of Fisheries and Marine Resources, Walvis Bay Municipality, Henties Bay Municipality, Swakopmund Municipality, Luderitz Town Council, Oramjemund Town Council and Namibian Ports Authority.

CHAPTER THREE: DESCRIPTION OF THE AUDIT AREA

3 SYSTEM DESCRIPTION

The mandates of the Ministry of Environment and Tourism (MET) and key stakeholders are as follows:

3.1 Ministry of Environment and Tourism

The Ministry is mandated by the Environmental Management Act, 2007 (Act No.7 of 2007), "...to promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment; to establish the Sustainable Development Advisory Council; to provide for the appointment of the Environmental Commissioner and environmental officers; to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters".

3.2 Ministry of Works and Transport

The Ministry is mandated by the Merchant Shipping Act, 1957 (Act No.57 of 1951), "...to provide for the control of merchant shipping and matters incidental thereto".

3.3 Namibian Ports Authority

Namibian Ports Authority (NAMPORT) is mandated by the NAMPORT Act, 1994 (Act No.2 of 1994), "...to undertake the management and control of ports and lighthouses in Namibia and the provision of facilities and services related thereto and to provide for matters incidental thereto."

3.4 Ministry of Agriculture, Water and Forestry

The Ministry is mandated by the Water Act, 1956 (Act No.54 of 1956), "...to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas; for the control of activities which may alter the natural occurrence of certain types of atmospheric precipitation; for the control, in certain respects, of the establishment or the extension of townships in certain areas; and for incidental matters."

3.5 Ministry of Mines and Energy

The Ministry is mandated by the Minerals (Prospecting and Mining) Act, 1992 (Act No. 33 of 1992), "...to provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto".

The Ministry is also mandated by the Petroleum (Exploration and Production) Act, 1991 (Act No. 2 of 1991), "...to provide for the reconnaissance, exploration, production and disposal of, and the exercise of control over, petroleum; and to provide for matters incidental thereto."

3.6 Ministry of Fisheries and Marine Resources

The Ministry is mandated by the Marine Resources Act, 2000 (Act No. 27 of 2000), "...to provide for the conservation of the marine ecosystem and the responsible utilization, conservation, protection and promotion of marine resources on a sustainable basis; for that purpose to provide for the exercise of control over marine resources; and to provide for matters connected therewith."

3.7 Local Authorities in Coastal Areas

The Local Authorities are mandated by the Local Authorities Act, 1992 (Act No. 23 of 1992), "...to provide for the determination, for purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties and functions of local authority councils; and to provide for incidental matters."

3.8 Roles and responsibilities of key players

3.8.1 Ministry of Environment and Tourism

3.8.1.1 The Minister

According to Section 4 (a)-(d) of the Environmental Management Act, 2007 (Act No 7 of 2007), "...the functions of the Minister are to:

- (a) Determine policies for the management, protection and use of the environment;
- (b) Prepare and publish policies, strategies, objectives and standards for the management and protection of the environment;
- (c) Co-ordinate environmental management at national level; and
- (d) Monitor and ensure compliance with this Act."

3.8.1.2 The Environmental Commissioner

The functions of the Environmental Commissioner in terms of Subsection 1 (a)-(j) of Section 17 of the Environmental Management Act, 2007 (Act No.7 of 2007) are to:

- a) "To advise organs of State on the preparation of environmental plans;
- b) To receive and record applications for environmental clearance certificates;
- c) To determine whether a listed activity requires an assessment;
- d) To determine the scope, procedure and methods of an assessment;
- e) To review the assessment report;
- f) To issue environmental clearance certificates;
- g) To maintain a register of environmental assessments undertaken;
- h) To maintain a register of environmental clearance certificates issued and environmental plans approved;

- i) To conduct inspections for monitoring compliance with this Act; and
- j) Perform any other duty or function which the Minister may assign or prescribe.”

3.8.1.3 Conservation Scientists/Environmental Officers/Inspectors

The job description of a Conservation Scientists, Environmental Officers/Inspectors from Department of Environmental Affairs under the Ministry of Environment and Tourism states that they should carry out the following key responsibilities:

- “Conduct field tests and collect samples for laboratory analysis and prepare detailed reports;
- Collect, synthesise and analyse data derived from pollution emission measurements, atmospheric monitoring, meteorological and mineralogical information, soil and water sample analysis;
- Participate in the inspection of: new development sites, industrial sites, air pollution sources, industrial and domestic waste treatment systems and sites, solid and hazardous waste management systems and water supply systems and plants;
- Review, evaluate and examine applicants for environmental clearance certificates and permits to ensure compliance with environmental management practices, policies and regulations;
- Develop and maintain database as required and input database entry information as received by applicants and other clients;
- Pre-screen, review, compile, record and process information for environmental clearance applications;
- Receive and investigate reports of non-compliance and report to the Environmental Officer/Inspector; and
- Participate in public education activities on environmental management; and assist and participate in environmental management workshops.”

3.8.1.4 Chief Control Warden

The job description of a Chief Control Warden, Chief Warden and Warden from Department of Parks and Wildlife Management under the Ministry of Environment and Tourism states that they should carry out the following key roles and responsibilities:

- “The Chief Control Warden represents the Ministry at the Subdivision level;
- Maintains communication within the subdivision, between the Subdivision and the rest of the Ministry and between the subdivision and public regarding conservation and the utilization of renewable natural resources;
- Ensure the enforcement of wildlife legislation in the region; and
- Ensure the enforcement in the region of all other laws applicable to the public service.”

3.8.1.4.1 Chief Warden

- “The maintenance of protected Areas;
- The provision of nature orientated information;
- Enforcement of nature conservation laws for the preservation and rehabilitation of the natural ecosystem and biodiversity therein; and
- The provision of technical support to scientific services.”

3.8.1.5 Warden

- “To provide nature orientated information;
- Enforcement of nature conservation laws for the preservation and rehabilitation of the natural ecosystem and biodiversity therein; and
- To provide technical support to conservation scientists.”

3.8.2 Ministry of Works and Transport

3.8.2.1 Powers of Proper Officers or Surveyor

According to Section 9 (d) of the Merchant Shipping Act, 1957 (Act. No.57 of 1951), “...the powers of the Proper Officer or Surveyor, “...may, in the execution of his or its duty or exercise of his or its functions:

- (i) Board any Namibian ship where she may be, or any ship other than a Namibian ship while she is within Namibia or the territorial waters of Namibia, and inspect the same or any part thereof, or any equipment thereof, or any articles on board, or any log-books, certificates or other documents relating to the ship or the crew thereof, and muster the crew of the ship and interrogate them;
- (ii) Enter any premises, including any land, structure or vessel, and inspect the same or any articles therein; and
- (iii) Copy any document inspected by or produced to him or it.”

3.8.3 Namibia Ports Authority

3.8.3.1 Safety, Health, Risk, Environment and Quality Officer

According to the job description, the Safety, Health, Risk, Environment and Quality (SHREQ) Officers are responsible for, among others:

- “...responsible for environmental, health and safety inspections at NAMPORT, stevedoring companies, contractors and other port users;
- Inspect tenant facilities;
- Inspect port user activities;
- Identification and monitor hazardous processes to determine exposure;
- Enforcement of legislative and operational regulations;

- Control the adherence of ships in the port to pollution prevention requirements; and
- Disposal of recovered pollutants and containment.”

3.8.4 Ministry of Agriculture, Water and Forestry

3.8.4.1 Hydrologist

The job description of a Hydrologist from Department of Water Affairs states that they should carry out the following key roles and responsibilities:

- “Should carry out water quality and compliance monitoring related activities supervise technical assistant staff as well as execute related administrative functions;
- attend to compliance monitoring, pollution control and research projects;
- administer the review and enforcement of regulations and water quality guidelines/standards for Namibia;
- process water quality and pollution control data to evaluate compliance and manage water resources; and
- monitor the operation of potable water purification plants, waste water treatment systems and disposal of effluent in the country.”

3.8.5 The Ministry of Mines and Energy

3.8.5.1 Mine Inspector

The job description of a Mine Inspector from Directorate of Mines states that they should carry out the following key roles and responsibilities among others:

- “Inspecting the mine workings in connection with health and safety and compliance of the regulations;
- Enquiring into alleged breaches of regulations;
- Inspecting shaft and shaft installation;
- Reporting of inspection carried out and completion of enquiries; and
- Controlling of environmental pollution.”

3.8.5.2 Commissioner and Chief Inspector Petroleum Affairs

Subsection 1 of Section 4 of the Petroleum (Exploration and Production) Act, 1991 (Act No. 2 of 1991), states that:

“...subject to the provisions of subsection (2), the Commissioner, the Chief Inspector or any officer who is engaged in carrying out the provisions of this Act and who has been authorized thereto by the Commissioner may, for the purposes of the administration of this Act –

- a) at all reasonable times enter any area, structure, vehicle, vessel, aircraft or building which has been, is or is to be used in connection with reconnaissance operations, exploration operations or production operations;

- b) inspect and test any machinery or equipment which has been, is or is to be used in connection with any of the operations referred to in paragraph (a);
- c) take or remove, for purposes of analyzing or testing, samples of petroleum or other substances from any land where any operations referred to in paragraph (a) are being carried out;
- d) seize samples or substances referred to in paragraph (c) or any book, record or document which may in his or her opinion be used in evidence in connection with any offence in terms of this Act;
- e) inspect, make extracts from, and make copies of, any book, record or document in relation to any operations referred to in paragraph (a);
- f) in relation to the health and safety of persons employed by the holder of a licence, in writing issue directions to, and impose restrictions on, such holder or any person employed by such holder in connection with any operations referred to in paragraph (a); and
- g) in writing direct - (i) the cessation of operations on or in, and the withdrawal of all persons from, any area, structure or building used in connection with any of the operations referred to in paragraph (a); (ii) the discontinuance of the use of any machinery or equipment, which the Commissioner, Chief Inspector or officer in question, as the case may be, considers dangerous for the safety of any person, unless such steps as the Commissioner, Chief Inspector or officer in question, as the case may be, may deem necessary to be taken for such safety specified in such notice has been taken.”

3.8.5.3 Petroleum Inspector

According to the job description of a Petroleum Inspector under the Directorate of Petroleum Affairs, the key roles and responsibilities among others are as follows:

- Analyzing daily drilling reports submitted by the Licensed Oil Companies and updated the person concerned;
- Conducting investigations and enquiries into the cause of accidents occurring during petroleum exploration and production operations;
- Conducting Rig Safety inspections/and audit before and during drilling operations as instructed by the Chief Inspector;
- Enforcing regulations on health, safety and welfare of persons, protection of property, the environment and natural resources;
- Inspecting mechanisms and equipment used in measuring crude oil and gas;
- Inspecting any machinery or equipment used in connection with petroleum exploration and production operations;
- Reporting any signs of oil spillage polluting the environment to the Chief Inspection and Petroleum Commissioner; and
- Monitor vessels discharges and compile an outturn documents.”

3.8.6 Ministry of Fisheries and Marine Resources

3.8.6.1 Biologists

According to the duty sheet of the fisheries biologists under the Directorate of resource Management, he or she is responsible to:

- a) “Plan and co-ordinate research activities for the programme in the short and medium term, as well as to conduct research (e.g. annual biomass surveys) on hake and other commercially important demersal stocks;
- b) Produce state of stock reports and recommendations to senior management regarding the management of the resources: policies, legislation and annual harvest levels; and
- c) Participation in stock assessment discussion, working group meetings and other similar forum, relating to hake and other resources”.

3.9 PROCESS DESCRIPTION

The Ministry of Environment Tourism is responsible for environmental management and is the lead Ministry for Coastal Management in Namibia. The following Ministries also play an important role in Coastal Management: the Ministry of Fisheries and Marine Resources is responsible for the managing fisheries resources, Ministry of Agriculture, Water and Forestry is responsible for overseeing the abstraction of water and monitoring water quality, Ministry of Works and Transport is responsible for marine pollution, Ministry of Mines and Energy is responsible for regulating prospecting, exploration and mining mineral resources, NAMPORT is responsible for the management of ports; and Local Authorities are responsible for monitoring pollutions as well as managing wastes. They are further tasked with the responsibility of implementing the United Nations (UN) Sustainable Development Goals (SDGs).

3.9.1 Overall Coastal Management

According to paragraph 2.4.3 of the National Policy on Coastal Management of Namibia, “...the policy provides a framework for the institutionalization and implementation of an integrated² approach to coastal management in Namibia.” This integrated approach will be implemented through the establishment and coordination of coastal laws and regulations.

Paragraph 7.1 further states that, “...monitoring and evaluation of the policy and its implementation will be the responsibility of the MET.”

² A continuous and dynamic process that unites government and the community, science and management, sectoral and public interest in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources.

3.9.1.1 Laws and Regulations

Paragraph 3.2.2 of The National policy on Coastal Management for Namibia states that, to “...ensure a comprehensive institutional and legal framework for coastal governance: Government will establish a clear governance framework that extends to regional and local authorities, non-governmental and community-based organizations, the public and the private sector. Strengthen governing authorities, structures and mechanisms for coastal management. Clarify the mandates, roles and responsibilities of the different entities involved in coastal management.”

It is a best practice that Namibia’s laws and regulations should be aligned to the 2030 United Nations (UN) Agenda for Sustainable Development which was adopted in September 2015, and is detailed as follows:

According to paragraph 16.3 of goal 16 of the 2030 UN Agenda for Sustainable Development, “...promote the rule of law at the national and international levels and ensure equal access to justice for all.”

The Ministry of Environment and Tourism and key stakeholders³ should respond to the impacts of climate change and monitor and enforce laws and regulations to prevent coastal pollution and degradation as explained in the paragraphs that follow.

3.9.2 Climate Change

According to the National Climate Change Strategy and Action Plan 2013-2020, “...the Ministry of Environment and Tourism (MET) has been designated as the government agency responsible for the coordination and implementation of climate policies and measures that will have an effective response to climate change in the interest of the country to protect present and future development.”

According to paragraph 13.1 of goal 13 of the 2030 UN Agenda for Sustainable Development, “...strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; and

Paragraph 13.2 further states that, “...integrate climate change measures into national policies, strategies and planning.”

According to paragraph 14.2 of goal 14 of the 2030 UN Agenda for Sustainable Development, “... sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans; and paragraph 14.3 further states that, “... minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.”

³ Ministry of Works and Transport, Ministry of Mines and Energy, Ministry of Agriculture, Water and Forestry, Ministry of Fisheries and Marine Resources, Namibian Ports Authority and Coastal Local Authorities.

3.9.3 Coastal Monitoring and Enforcement of Laws and Regulations

3.9.3.1 Environmental Management Plans

Subsection 3 of Section 26 of the Environmental Management Act, 2007 (Act No.7 of 2007), states that, "...the Environmental Commissioner monitor compliance with environmental plans and may-

- (a) Take any steps or make any inquiries the Commissioner considers necessary in order to determine if environmental implementation plans are being complied with by organs of the state; and
- (b) If, as a result any steps taken or inquiry made under paragraph (a), the Commissioner is satisfied that an environmental implementation plan is not substantially being complied with, serve a written notice on the organ of state concerned, calling it to take such specified steps as the Commissioner considers necessary to remedy the non-compliance."

3.9.3.2 Environmental Clearance Certificate

Subsection 1 of Section 27 of the Environmental Management Act, 2007 (Act No.7 of 2007), states that, "...the Minister, after following the consultative process referred to in section 44 (*See Appendix VI*), may list, by notice in the Gazette, activities which may not be undertaken without an environmental clearance certificate." This environmental clearance certificate is a tool used by the Ministry of Environment and Tourism to monitor and prevent the degradation of natural habitats at the coast.

Furthermore, Subsection 1 of Section 31 of the Environmental Management Act, 2007 (Act No. 7 of 2007), states that, "...despite any other law to the contrary, a competent authority may not issue an authorization unless the proponent has obtained an Environmental Clearance Certificate."

Subsection 2 of Section 31 further states that, "...an authorization issued contrary to subsection 1 is invalid."

According to paragraph 15.5 of goal 15 of the 2030 UN Agenda for Sustainable Development, "...take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species."

3.9.3.3 Monitoring Human Impacts in Coastal National Parks

According to Article 8 (a)-(b) of the United Nations (UN) Convention on Biological Diversity, “...each Contracting Party shall, as far as possible and as appropriate:

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity; and
- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity.”

According to paragraph (f) of the Dorob National Park Management Plan for the period 2010-2017, “...MET should monitor human impact of landscapes, ecosystems, habitats, and species with particular attention to fragile and high value components of the system, and human activities known to have significant impacts.”

3.9.3.4 Verification of Inspections on Registered Ships

According to paragraph 3 (a) of regulation 4 of Annex 1 of the MARPOL Convention, “...surveys of ships as regards the enforcement of the provisions of this Annex shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

Furthermore, paragraph 3 (d) states that, “...in every case, the administration concerned shall fully guarantee the completeness and efficiency of the survey and inspection and shall undertake to ensure the necessary arrangements to satisfy this obligation.”

According to paragraph 6.3 of goal 6 of the 2030 UN Agenda for Sustainable Development, “...by 2030 improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemical and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.”

Paragraph 14.1 of goal 14 states that, “...by 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.”

3.9.3.5 Inspection on Licensed ships

According to paragraph 2 of regulation 4 of Annex 1 of the MARPOL Convention, “...the Administration shall establish appropriate measures for ships which are not subject to the provisions of paragraph (1) of this regulation in order to ensure that the applicable provisions of this Annex are complied with.”

According to Subsection 1 (a)-(b) of Section 68 of the Merchant Shipping Act, 1957 (Act, No.57 of 1951), “...the owner or the master- of a vessel which-

- (i) Is not registered as a ship in Namibia or elsewhere; and
- (ii) Operates at or from a port in or from anywhere else on the coast of Namibia or

...of a ship which has been exempted under provisions of subsection (3) of section 13, shall before such small vessel or ship is used in Namibia be in possession of a licence issued to him in terms of this Act by a proper officer.”

3.9.3.6 Inspections on Foreign ships

According to paragraph 1 of regulation 8 A Annex 1 of the MARPOL Convention, “...a ship when in a port or an offshore terminal of another Party is subject to survey by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by oil. Furthermore, in the circumstances given in paragraph (1) of this regulation, the party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this convention.”

According to paragraph 6.3 of goal 6 of the 2030 UN Agenda for Sustainable Development, “...improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemical and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

According to paragraph 14.1 of goal 14 of the 2030 UN Agenda for Sustainable Development, “...prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.”

3.9.3.7 Inspections on Mining Vessels

Subsection 1 of Section 5 of the Minerals (Prospecting & Mining) Act, 1992 (Act No. 33 of 1992), states that, “...the Commissioner or any officer who is engaged in carrying out the provisions of this Act and who has been authorized thereto by the Commissioner may, in order to exercise any power or perform any duty or function conferred or imposed by this Act-

- (a) “At all reasonable times enter any land or place where any reconnaissance operations, prospecting operations or mining operations have been, or are to be carried on, including any accessory works, or land to which any such operations or accessory works relate;
- (b) Take or remove, for purposes of mineralogical examination, assaying, test work or marketability surveys from-
 - (i) any land, place or accessory works referred to in paragraph (a), any sample of any mineral or group of minerals; or
 - (ii) any such land, place or accessory works, a sample taken of any sample, or taken of any mineral or group of minerals won or mined, in the course of any operations referred to in paragraph (a);

- (c) Seize any sample referred to in paragraph or any book, record or document which may in his or her opinion be used in evidence in connection with any offence in terms of this Act;
- (d) Inspect, make extracts from, and make copies of any book, record or document in relation to any operations or accessory works referred to in paragraph (a); and
- (e) May make such investigations and inquiries as may be necessary to determine whether the provision of this Act or any term and condition, direction or order determined, given or made under this Act is being complied with.”

Paragraph 6.3 of goal 6 of the 2030 UN Agenda for Sustainable Development states that, “...improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Paragraph 15.5 of goal 15 of the 2030 UN Agenda for Sustainable Development states that, “...take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.”

3.9.3.8 Inspections at Petroleum Exploration Operations

According to subsection 1 (a)-(c) Section 4 of the Petroleum, (Exploration and Production) Act, 1991 (Act No. 2 of 1991), “...subject to the provisions of Subsection (2), the Commissioner, the Chief Inspector or any officer who is engaged in carrying out the provisions of this Act and who has been authorized thereto by the Commissioner may, for the purposes of the administration of this Act-

- (a) “At all reasonable times enter any area, structure, vehicle, vessel, aircraft or building which has been, is or is to be used in connection with reconnaissance operations, exploration operations or production operations;
- (b) Inspect and test any machinery or equipment which has been, is or is to be used in connection with any of the operations referred to in paragraph (a);and
- (c) Take or remove, for purposes of analyzing or testing, samples of petroleum or other substances from any land where any operations referred to in paragraph (a) are being carried out.”

Subsection 2 (a) (b) and (g) of Section 38 of the Petroleum, (Exploration and Production) Act, 1991(Act No.2 of 1991), further states that, “... without derogating from the generality of Subsection (1), the holder of an exploration licence shall –

- (a) “Control the flow and prevent the waste, escape or spilling in the exploration area of petroleum, water or any gas;
- (b) Prevent the waste or spilling in the exploration area of water or drilling fluid or water and drilling fluid or any other substance extracted from a well drilled for purposes of or in connection with exploration operations or used in relation to the drilling of such a well; and;

- (g) Furnish to the Commissioner prior to the drilling of any well a report containing particulars of the technique to be employed, an estimate of the time to be taken, the material to be used and the safety measures to be employed in the drilling of such well.”

3.9.3.9 Monitoring Compliance of Sea Water Abstraction

According to Subsection 1 of Section 12 of the Water Act, 1956 (Act No.54 of 1956), “...any person who desires to establish an undertaking in respect of which any quantity of water, including sea water, is required to be used for industrial purposes or who desires to expand an industrial undertaking in respect of which any quantity of water, including sea water, is used or is required to be used for such purposes shall, before initiating or establishing or expanding such undertaking-

- (c) If he desires to use for industrial purposes a quantity of public water exceeding three hundred cubic meter on any one day or two hundred and fifty cubic meter on an average per day during any month (whether or not any portion of such water is, in case of water abstracted from a public stream), apply to the Minister authorizing such use.”

Subsection 2 of Section 12 of the Water Act, 1956 (Act No.54 of 1956), further states that, “... any person who has during the period of six months referred to in paragraph (b) of sub-section (1) of section eleven used in connection with any undertaking a quantity of public water exceeding on an average two hundred and fifty cubic meter per day, shall within six months after the commencement of this Act lodge with the secretary a statement showing the quantity of such water so used during that period.”

According to paragraph 6.4 of goal 6 of the 2030 UN Agenda for Sustainable Development, “...ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.”

3.9.3.10 Monitoring Compliance of Effluent Disposal into the Sea

Subsection 1 (a) of Section 21 of the Water Act, 1956 (Act No.54 of 1956), states that, “...the purification of any waste water or any effluent or waste produced by or resulting from the use of water for industrial purposes shall form an integral part of the process of such use and, subject to the provisions of Sub-section (5) (*See attached appendix VII*), any person using water for industrial purposes shall purify such water, effluent or waste so as to conform to such requirements as the Minister may from time to time after consultation with the South African Bureau of Standards, prescribe by notice in the Gazette (*see Government Gazette regulations r553 of 1962*) either generally or in relation to water used for or in connection with any one or more specified industrial purposes or in relation to water derived from any specified public stream or in relation to water used in any prescribed area.”

Any requirements prescribed under paragraph (a) shall be such as to ensure that the waste water, effluent or waste to which such requirements relate will, after purification in accordance with those requirements, be at least as free of impurities as would have been the case if the purification thereof had been effected in accordance with the recommendation.”

Subsection 1 and 2 of Section 22 of the Water Act, 1956 (Act No. 54 of 1956), states that, “...a local authority having jurisdiction over the disposal of sewage may, after purifying the effluent derived from the treatment of such sewage in accordance with standards prescribed under subsection 1 of section 21 and with the permission of the Minister use such effluent for any purpose approved by the Minister or disposed of such effluent for use by any person or discharge such effluent in a public stream.”

Subsection 2 further states that, “...the Minister may in writing, and on such conditions as he might deem exempt from compliance with the provisions of Section 21, any local authority which does not dispose of water used for any industrial purpose other purification or disposal of sewage.”

Furthermore, according to the Government Gazette r553 of 1962, “...it is hereby notified that the Minister of Water Affairs (Ministry of Agriculture, Water and Forestry) has, in terms of paragraph (a) of Sub-section (1) of Section 21 of the Water Act, 1956 (Act No. 54 of 1956) prescribe the following requirements (*see attached appendix VIII*) to which waste water or effluent, produced by or resulting from the use of water for industrial purposes, shall conform after purification.”

According to paragraph 6.3 of goal 6 of the 2030 UN Agenda for Sustainable Development, “... improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.”

According to paragraph 14.1 of goal 14 of the 2030 UN Agenda for Sustainable Development, “... prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.”

3.9.4 Coastal Pollution and Degradation

3.9.4.1 Control of Pollution into the sea

According to paragraph 7.2 of the Industrial Waste Water and Effluent Disposal Exemption permit of the Namibian Diamond Corporation (NAMDEB), “...the mining operation shall be conducted in such a manner that no chemicals, fat-grease-oil or other hydrocarbons will be disposed of in any that may result in pollution of any watercourse (including the sea).”

Furthermore, according to paragraph 9 of the Industrial Water and Effluent Disposal Exemption permit of the NAMDEB, “...irrespective of the conditions as set out in the permit, NAMDEB shall be responsible for and take immediate remedial action should at any time there be an unforeseen occurrence of surface or groundwater pollution in or outside the monitoring area that

can be related to the activities of the mine. NAMDEB shall inform the Ministry of any such occurrence.”

Subsection 1 (a) of Section 21 of the Water Act, 1956 (Act No.54 of 1956), states that, “...the purification of any waste water or any effluent or waste produced by or resulting from the use of water for industrial purposes shall form an integral part of the process of such use and, subject to the provisions of Sub-section (5) (*see attached appendix VII*), any person using water for industrial purposes shall purify such water, effluent or waste so as to conform to such requirements as the Minister may from time to time after consultation with the South African Bureau of Standards, prescribe by notice in the Gazette (see Government Gazette regulations r553 of 1962) either generally or in relation to water used for or in connection with any one or more specified industrial purposes or in relation to water derived from any specified public stream or in relation to water used in any prescribed area.”

3.9.4.2 Pollution Control and Monitoring at the Port

According to Section 14 (i) of the Namibian Ports Authority Act, 1994 (Act No. 2 of 1994), Namibia Port Authority (NAMPORT) function is, “...to protect the environment within its areas of jurisdiction.”

This is done through the lease agreements NAMPORT enters into with tenants which states that “.....any officer authorized by the landlord may, at all reasonable times, but by prior appointment, enter upon and inspect the premises for the purposes of monitoring or ensuring the tenant compliance with the conditions of this lease or specifically environmental issues as contemplated in clause 18 (*see attached appendix IX*) hereof, and the tenant undertakes to afford such officer all reasonable facilities for such inspection.”

Paragraph 6.3 of goal 6 of the 2030 UN Agenda for Sustainable Development states that, “...improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.”

Paragraph 15.5 of goal 15 of the 2030 UN Agenda for Sustainable Development states that, “...take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.”

3.9.4.3 Waste Management at Coastal Local Authorities

Subsection 1 (c) of Section 94 of the Local Authority Act, 1992 (Act No. 23 of 1992), “...a local authority council may, after the consultation with the Minister, make regulations by notice in the Gazette in relation to- the provision, regulation and control for the removal of disposal of night soil, refuse, lop water, garden and stable litter and otherwise offensive or unhealthy matter.”

According to Section 20 (b) and (d) and Section 23 (b) and (d), of the regulation relating to waste management: Local Authorities Act, 1992 (Act No. 23 of 1992) of the Luderitz Town Council⁴

⁴ Coastal town

and Walvis Bay Municipality respectively, "...the council is responsible for the effective design, construction, operation, management and monitoring of the sanitary land fill site in accordance with the provision of applicable environmental regulation, by among others, enforcing.-

- The control and monitoring of the environmental pollution due to illegal burning of waste, ground water pollution, leachate, windblown waste, dust emission and other parameter as may emanate from the operation of such sanitary landfill site; and
- That only waste approved for disposal in accordance with wastes and landfills classification is disposed of at a particular sanitary landfill site."

Paragraph 15.5 of goal 15 of the 2030 UN Agenda for Sustainable Development states that, "...take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species."

3.9.4.4 Degradation at Protected Areas

According to Article 8 (c) of the UN Convention on Biological Diversity, "...each Contracting Party shall, as far as possible and as appropriate:

(c) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies."

According to of paragraph 15.5 of goal 15 of the UN 2030 Agenda for Sustainable Development, "...take urgent and significant action to reduce the degradation of natural habitats halt the loss biodiversity and by 2020, protect and prevent the extinction of threatened species."

3.9.4.5 Control of Pollution into Coastal Rivers

According to paragraph 5.6 of the domestic and industrial effluent exemption permit of NAMDEB, "...construction of pipes, the material chosen shall be done in such manner as to never create any danger of spillage, pollution or other nuisance."

Sand mining that takes place in rivers is regulated by the DEA under MET through Annexure 3.2 of the regulations of the Environmental Management Act, 2007 (Act No. 7 of 2007), which states that, "...other forms of mining or extraction of any natural resources whether regulated by law or not."

The DWAF under the Ministry of Agriculture, Water and Forestry regulates the operations of industries in rivers through Section 26 (c) of the Water Act, 1956 (Act No.54 of 1956), which states that, "...the Minister may make regulations relating to – the prevention of wastage or pollution of public or private water, including underground water, and the powers and duties of persons appointed to exercise control in respect thereof."

CHAPTER FOUR: FINDINGS

4.1 Overall Coastal Management

During the period under review, the audit found through interviews and documentary reviews that a sectoral approach is currently applied by the Ministry of Environment and Tourism (MET) and key stakeholders to manage the coastal areas. This is because the management of activities at the coast is currently guided by fragmented⁵ sectoral policies, which risks user conflicts in carrying out mandates.

4.1.1 Laws and Regulations

The audit observed that Namibia adopted the United Nations (UN) Sustainable Development Goals (SDGs) in September 2015 but were not integrated into National Development Plans at the time of the audit.

However, at the time of the audit the MET did not put in place a comprehensive institutional and legal framework for coastal governance as stated by paragraph 3.2.2 of the National Policy on Coastal Management for Namibia 2012.

As a result, the policy objective for integrative and cooperative coastal governance among the MET and key stakeholders is not achieved.

The audit observed that the relevant national relevant laws for MET and key stakeholders are aligned to the UN SDGs related to coastal management (See attached appendix X).

However, the audit found through interviews and documentary reviews that it is impossible with the current shortcoming in the existing laws and regulations to achieve the UN SDGs on coastal management as indicated below:

- The audit observed that MET developed the Namibia's Pollution Control and Waste Management Policy. However, laws and regulations on Waste Management were not developed by MET at the time of the audit. As a result, there is inconsistency in waste management by the coastal local authorities visited;
- The audit observed that MET developed a National Policy on Climate Change in 2011. However, laws and regulations were not developed at the time of the audit. As a result, there is no established legal mechanisms for policy implementation for climate change;
- Ministry of Agriculture, Water and Forestry (MAWF) did not develop regulations for effluent disposal into the sea. As a result, MAWF cannot regulate and hold the industry accountable for sea water pollution;

⁵ Isolated coastal policies

- Namibia is not a signed-up member to Annexure 4 of the MARPOL Convention, therefore will not be able to control ships from dumping untreated sewage into the sea.
- Ministry of Works and Transport (MWT) signed the Abuja Memorandum of Understanding (MoU) in 1999, but was not ratified at the time of the audit and is therefore, not connected to the Abuja MoU Information System (AMIS) that tracks the port state inspections conducted on ships by members' states of the Memorandum. The system could assist the MWT in planning and prioritizing on port state inspections; and
- The Local Authorities Act, 1992 (Act No.23 of 1992) does not impose any specific obligation on Local Authorities (LA's) at coastal towns to address environmental conservation in the coastal and marine areas to promote sustainable development.

As a result, due to the abovementioned shortcomings in the laws and regulations, Namibia might not meet its international commitments made towards the achievement of the SDGs related to coastal management as well as the overall management of coastal areas.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

“The Ministry of Environment and Tourism has recognized this issue and sought to put in place the institutional and legal framework for integrated coastal governance during the period under review which is embodied in the Integrated Coastal Zone Management Bill (ICZM). The ICZM Bill is an important measure to address shortcomings within existing laws and regulations related to coastal management and for ensuring the effective implementation of the UN Sustainable Development Goal 14 on the conservation and sustainable use of ocean, seas and marine resources.

The Accounting Officer further pointed out that laws and regulations on waste management were not developed at the time of the audit. This matter has been recognized by the Ministry and a Pollution Control and Waste Management Bill was under development during the reporting period. It was subsequently decided to integrate key elements of this Bill into the Waste Management Regulations of the Environmental Management Act and to develop a National Solid Waste Management Strategy.”

4.2 Climate Change

The audit observed that the Department of Environmental Affairs (DEA) under MET developed and adopted the National Climate Change Strategy & Action Plan for the period of 2013-2020 to implement the National Policy on Climate Change for Namibia 2011. The climate change measures were included in the Integrated Urban Spatial Development Frameworks of all coastal Local Authorities, except Swakopmund Municipality and Luderitz Town Council. The latter could not provide such evidence at the time of the audit.

At the time of audit, all LA's at the coast could not provide evidence that climate change adaptation measures were implemented for existing (See pictures 1-2 below) and future infrastructural development close to the sea, which might be at risk to beach erosion and being

washed away by strong tides and sea level rises. An assessment⁶ conducted in 2011 by MET revealed that the damage that might be caused by sea level rises is estimated to be N\$ 27.7 billion by 2030.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

“The Accounting Officer commented that Namibia’s National Climate Change Strategy and Action Plan (NCCSAP) (2013-2020) was approved by Cabinet during the period reviewed in this report. It contains strategic aims to strengthen integrated coastal zone management, to encourage the adoption of town and regional planning toward climate resilient human settlement, and to monitor ecosystem and biodiversity changes and their impacts related to climate change. There is no legal mechanism for policy implementation for climate change but both the Ministry of Urban and Rural Development and the Ministry of Fisheries and the Ministry of Fisheries and Marine Resources are represented on the National Climate Change Committee, which oversees implementation of the NCCSAP. It is clearly stated in the National Climate Change Strategy and Action Plan what each Ministries’ role and corresponding responsibilities are in mitigating the impact of climate change. It is therefore concerning that local authorities and the Ministry of Fisheries and Marine Resources have not put in place measures relating to the impacts of climate change. There is no intention at this time to establish specific legislation on climate change.”

⁶ Sea-level rise in Namibia’s coastal towns and wetlands: projected impacts and recommended adaptation strategies final report. 11 September 2011

Picture1: Infrastructure build close to the sea at Swakopmund



Picture 2: Infrastructure build close to the sea at Luderitz and Henties Bay respectively



Furthermore, the National Climate Change Strategy & Action Plan 2013-2020 projected the Benguela Current became warmer which decreases fish stock due to climate change. An Environmental Report of the Ministry of Fisheries and Marine Resources (MFMR) on Sardine for the year 2015 corroborates this, which indicated that the sea surface temperature of northern Namibian coast has become warmer.

However, at the time of the audit, the Directorate of Resource Management under MFMR did not provide any evidence on the impacts of climate change on the marine ecosystem to provide assurance that measures are adopted to respond to the impacts when the need arise.

4.3 Coastal Monitoring and Enforcement of laws and regulations

4.3.1 Environmental Management Plans

The audit found that conservation scientists from the DEA under MET did not conduct complete inspections to ensure compliance to Environmental Management Plan (EMP's) of proponents⁷ and Organs of State⁸ operating at the coast, i.e. soil and water sample were not collected for laboratory analysis and data derived from pollution emission measurements were not analyzed. As a result, the DEA cannot ensure compliance to EMP's to prevent pollution and degradation.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

“Non-compliance to Environmental Management Plans(EMP's) of proponents and Organs of State at the coast as well undertaking listed activities by proponents and Organs of State at the coast have Environmental Clearance Certificates (ECC) are concerns that have been observed by the Ministry and are concerns that the Ministry is continuously trying to address through strengthening our inspections function and by raising awareness among proponents, organs of state and the general public of the relevant provisions of the Environmental Management Act of 2007.

The ability of the Ministry to monitor and enforce compliance to the Act through inspections is limited due to lack of staff, financial resources and regional presence. The Inspectorate Sub-Division also only became staffed and operational in 2014 but was able to carry out approximately 124 site inspections nationwide in 2015/16. A dedicated inspection and EMA awareness programme was also undertaken in August 2014 to Erongo Region with a view to addressing the concerns regarding the EMP's and ECC.”

4.3.2 Environmental Clearance Certificates

The audit found that the DEA under MET did not ensure that the following listed activities undertaken by proponents and Organs of States operating at the coast have Environmental Clearance Certificates (ECC's):

- Fishing companies disposing effluent into the sea;
- Salt Company (Pty) Ltd and existing operations of Walvis Bay Salt Holding (Pty) Ltd mining salt in Swakopmund and Walvis Bay respectively;
- Local Authorities Waste Water Treatment Plants;
- Ships disposing sewage into the sea;
- NAMPORT's syncrolift ship repair yard and bunkering operation; and
- Coastal local authorities' landfill/dumpsite.

This is because the DEA did not conduct any inspections at the above stated proponents and Organs of State during the period under review.

⁷ Proponents: a person who proposes to undertake a listed activity

⁸ Organ of State: any Office, Ministry or Agency of State or administration in the local or regional spheres of government

As a result, the DEA did not ensure that the above mentioned proponents and Organ of State complied with Subsection 1 of Section 27 of the Environmental Management Act, 2007 (Act No. 7 of 2007) as stated in paragraph 3.9.3.2.

The audit further found that the following key stakeholders of the MET issued authorization to proponents without them obtaining the ECC as required by Subsections 1 and 2 of Section 31 of the Environmental Management Act, 2007 (Act, No. 7 of 2007):

- The DWAF under the MAWF issued Waste Water Effluent Disposal Exemptions Permits to coastal Local Authorities;
- The DWAF issued Sea Water Abstraction and Waste Water Effluent Exemption Water Permits to all fishing factories;
- The key directorates under the MFMR, MWT and MME issued authorizations to all companies who applied to undertake bunkering operations at the Namibian coast; and
- The Municipality of Walvis Bay issued a Waste Water Discharge Permit to the Walvis Bay Salt Holdings for waste to be discharged into the Municipal sewer system.

This is because the above stated Organs of State might not be aware of the requirements of the Environmental Management Act, 2007 (Act No.7 of 2007). As a result, all the authorization issued by the above stated Organs of State are invalid.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

“The Accounting Officer commented that it is not the stakeholders of the MET that are issuing authorizations to proponents before obtaining ECCs. This is being done by other Offices/Ministries/Agencies (OMAs). This is also a concern that has been observed by the Ministry that is being addressed through improved collaboration with the other OMAs and in the revision of the EIA Regulations that is being undertaken in the 2017/18 financial year. Furthermore, section 31(1) of EMA 7 of 2007, clearly stipulates that despite any other law to the contrary, a competent authority may not issue an authorization unless the proponent has obtained an environmental clearance certificate in terms of the EMA.

The specific cases mentioned in 4.3.2 have been well noted and will be addressed accordingly.”

4.3.3 Monitoring Human Impact in Coastal National Park

The audit observed that MET has declared the entire Namibian coastline a protected area. The Dorob National Park was Gazetted in December 2010 and the Sperrgebiet National Park was Gazetted in November 2008. MET developed and adopted the Management Plan for the Dorob and Sperrgebiet National Parks in 2013 and 2014 respectively.

Data analyzed indicated the Directorate of Parks and Wildlife Management under MET did not consistently monitor the human impacts in the most sensitive areas in the Dorob National Park.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

The Accounting Officer commented that monitoring for the period under review was affected by a lack of staff and budget. MET further worked with the private sector to arrange voluntary cleanups and other cleanup campaigns along the coast.

4.3.4 Verification of Inspection on registered Ships

The audit found that DMA under MWT did not verify 58 sampled inspections for the years under review conducted on fishing and mining registered ships by Recognized Organization as indicated in the table below:

Verification of inspection for the calendar years 2013-2015

Calendar year	Sampled inspection by Recognized Organization	Sampled inspection verified by DMA	Sampled inspections not verified by DMA	Percentage not verified (%)
2013	17	0	17	100
2014	21	2	19	90
2015	24	2	22	92
Total	62	4	58	94

Source: DMA Inspection Reports

The table above indicates that in the year 2013, DMA did not verify any inspections conducted by Recognized Organization, while in the year 2014; DMA did not verify 90% of inspections conducted by Recognized Organization. In the year 2015, DMA did not verify 92% inspections conducted by Recognized Organization.

The audit found that four ships verified by DMA had a total of 23 deficiencies⁹ after they have been inspected and cleared by the private ship surveyors. The issuing of authorization to sub-standard ships by DMA without verifying inspection reports might risks loss of lives and marine pollution.

4.3.5 Inspection on Licensed Ships

The audit could not determine the extent to which DMA conducted inspections on ships less than 25 tons, due to incomplete evidence provided and inconsistency in record keeping.

⁹ IOPP Certificate was not endorsed; Ship Oil Pollution Emergency Plan (SOPEP) was not approved by DMA, No oil record book on board, No oil spill equipment and Fire service pump has no pressure.

4.3.6 Inspection on Foreign Ships

The audit found through data analysed that the Division Surveying and Inspections under DMA only conducted 116 inspections of 3007 foreign ships for the calendar years 2013-2015 as indicated in the table below:

Table 6: Inspections Conducted on Foreign Ships

Calendar year	Number of Foreign Ships visiting Walvis Bay and Luderitz Ports	Foreign ships inspected	Foreign ships not inspected	Percentage not inspected (%)
2013	908	43	865	95
2014	1058	44	1014	96
2015	1041	29	1012	97
Total	3007	116	2891	96

Source: DMA Monthly Reports

The table above indicates that during the calendar year 2013, the DMA did not conduct inspections on 95% foreign ships that visited the Walvis Bay and Luderitz Ports. During the calendar year 2014 and 2015 the percentage of foreign ships not inspected by DMA increased to 96% and 97% respectively. This risk ships not inspected polluting the marine environment with oils of unrepaired machinery.

COMMENTS BY THE AUDITEE

MINISTRY OF WORKS AND TRANSPORT

“The Accounting Officer Commented that the reasons for failing to perform its mandate are:

- Restructuring of the Directorate is required and long overdue.*
- Lack of Technical Staff.*
- Under staffing, particularly the Divisions of Legal and International matters as well as that of Maritime Safety and Security.”*

4.3.7 Inspections on Mining Vessels

The Directorate of Mines (DM) under MME planned to conduct inspections on 17 mining vessels for the 2013/14-2016 financial year. However, the audit found that the DM only conducted 2 of the 17 inspections during the 2014/15 financial year, whereas no inspections were conducted for the 2013/14 and 2015/16 financial years respectively. Furthermore, deficiencies were found on the 2 inspections conduct by DM and they could not provide evidence that such deficiencies were rectified.

As a result, ships with deficiencies such as insufficient dirty oil storage, fuel leaks in the engine room, lack of audible and visual alarm in engine room operated on the Namibian sea risks the health and safety of workers as well as pollution on the marine environment.

4.3.8 Inspections at Petroleum Exploration Operations

The Directorate of Petroleum Affairs (DPA) under MME could not provide audit evidence to ascertain that inspections relating to the testing of machinery and equipment at all oil exploration companies in Namibia were carried out to ensure compliance with Petroleum Exploration Licence Conditions. This risks the oil exploration companies spilling drill fluid into the sea which can be harmful to the marine animals.

4.3.9 Compliance Monitoring of Sea Water Abstraction

The Department of Water Affairs and Forestry (DWAFF) under the Ministry of Agriculture, Water and Forestry (MAWF) could not provide assurance to the audit that it effectively ensured compliance to the Sea Water Abstraction Permit conditions. The data analysed revealed that 18 of 19 (*See appendix XI*) fishing, mining and aqua farming organizations, Sea Water Abstraction figures were not recorded on the Sea Water Abstraction Permit Register of the DWAFF.

The audit further found the following non-compliance to Sea Water Abstraction Permit conditions during physical observations:

- Walvis Bay Salt Holdings (Pty) Ltd abstracted 120 381 000 m³ of sea water during the 2016 calendar year exceeding its Sea Water Abstraction Permit required amount of 100 000 000 m³ during its salt mining operations;
- Salt Company (Pty) Ltd was abstracting sea water without a Water Abstraction Permit; and
- Sea flower Fishing Company operated without flow water meters to monitor the amount of sea water abstracted.

This due to a lack of compliance monitoring inspections conducted by DWAFF on sea water abstraction permit conditions.

As a result, the MAWF is not effective in ensuring compliance in preventing the wastage of sea water abstraction as per the permit conditions.

4.3.10 Compliance Monitoring of Effluent Disposal into the Sea

The audit observed that the DWAFF under the MAWF conducted compliance monitoring inspections relating to Waste Water Effluent Disposal Exemptions Permits (WWEDEP) conditions at operations disposing effluent into the sea at coastal towns in the Erongo and Karas regions once per calendar year.

However, the following non-compliances were found by the audit:

The DWAFF's procedure of determining the quality of effluent disposed into the sea is inconsistently applied in comparison to the water quality assessment stipulated by the Waste Water Effluent Disposal Exemption permits.

The data analysed revealed that for the financial years under review, the final effluent disposed into the sea for Walvis Bay Salt Holdings (Pty) Ltd and Etosha Fishing Company was compared with the sea water quality before disposal into the sea.

However, the effluent quality of Tunacor IQF Factory, United Fishing Enterprises and NAMDEB were not compared with the sea water quality before disposal into the sea. No evidence was provided for 10 fishing companies and two mining companies to determine the procedure of the quality of the effluent disposed into the sea. (See attached appendix XII). The MAWF could not provide sea water quality standards for effluent disposal for audit purposes. Effluent disposed into the sea might be harmful to the marine ecosystem and fish resources which are one of the biggest contributors to the Gross Domestic Product.

COMMENTS BY THE AUDITEE

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

“The Accounting Officer commented that random sea water samples may be collected to understand the marine water quality or make random comparisons with effluent quality from fish factories and salt operations (e.g. Walvis Bay Salt Holdings and Etosha Fisheries) in 2016, while no comparison is made for Tunacor Fish Factory, United Fishing and Namdeb samples. This does not constitute an inconsistency, but rather a deliberate effort by DWAF to understand the marine water quality which is the environment into which fishing operations discharge.”

Furthermore, the DWAF could not provide evidence of how they monitored the average dry weather flows of 18 of 19 (see attached appendix XIII) fishing, mining companies and Coastal Local Authorities disposing effluent into the sea to assure the audit that unwanted harmful overflows from Waste Water Treatment Plants will be avoided.

4.4 Coastal Pollution and Degradation

4.4.1 Control of Pollution into the Sea

The audit found that the DWAF under MAWF issued a Waste Water Effluent Disposal Exemption Permit (WWEDEP) to NAMDEB Mining Area 1 mine to dispose sewerage into the sea without complying to the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962 for sewerage relating to dissolved oxygen, ortho-phosphate and electrical conductivity during the period under review. (See attached appendix XIV)

This is because MAWF did not ensure the timely implementation of NAMDEB’s action plans to implement an environmentally friendly wastewater management system at Mining Area 1 as per paragraph 12.2.1.1.9 of the permit. This risks pollutions to the marine environment thereby negatively affecting the marine ecosystem which is an important food source for the country.

COMMENTS BY THE AUDITEE

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

“The Accounting Officer commented that the disposal of effluent into the Atlantic Ocean is not recommended by DWAF. NAMDEB was advised to stop this practice and investigate other treatment options and land disposal of final effluent. DWAF acknowledges that this change in treatment may not be realized quite urgently, therefore Namdeb was requested to submit a plan of action to DWAF outlining when and how a new and environmentally friendly wastewater management system will be implemented at MA. 1. NAMDEB was engaged during

subsequent annual inspections and urged to consider changing to a more environmentally friendly and land-based wastewater treatment and disposal system at MA.1. The permit was therefore given with a condition which states “The mine management must strive to come up with an alternative measure for the disposal of final effluent onto land instead of disposing it into the sea. In consultation with DWAF, NAMDEB is to investigate the option of treating and disposing of effluent in a mobile bio-filter system attached to an evaporation ponds system. Based on this condition, the validity of the permit shall be limited to two (2 years only) to allow implementation of this system.”

The audit also found that the DWAF did not ensure that the Salt Company (Pty) Ltd operates with a WVEDEP for brine disposal into the Atlantic Ocean (See picture 3 below). This is due to a lack of inspections conducted by DWAF at the mine.

Picture 3: Brine disposed into the sea by the Salt Company (Pty) Ltd



4.4.2 Pollution Control at the Port

Documents analyzed and physical observations revealed that NAMPORT conduct inspections at the ports. However, environmental incidents caused by tenants do reoccur at the ports. The recurrence of environmental incidents risk coastal environment pollution as referred in picture 4 below:

Picture 4: Oil spills and lack of drip trays for oil drums at NAMPORT



4.4.3 Waste Management at Coastal Local Authorities

The audit found that the Swakopmund and Henties Bay Municipalities as well as the Oranjemund Town Council did not develop waste management regulations, whereas the Walvis Bay Municipality and Luderitz Town Council have them in place but there is no compliance to these regulations. This is illustrated in the picture 5 below.

Physical observation revealed inappropriate management of dump/landfill sites such as illegal waste burning, fences in disrepair condition, mixture of hazardous and general waste at local authorities that have waste management regulations and those that do not have, except the Swakopmund Municipality.

Inappropriate management of dump/landfill sites risks the wind blowing waste into the Dorob and Sperrgebiet National Parks and also into the sea which may further lead to costly clean-ups.

Picture 5: Unbunded oil container at Walvis Bay landfill site and wastes burned at Luderitz dumpsite respectively



The audit observed that the Department of Parks and Wildlife Management (DPWM) under MET ensured that the Dorob National Park is fenced off and have warning signs indicating the Parks location along the roads between Walvis Bay and Swakopmund; and Henties Bay and Swakopmund.

However, the audit found that DPWM did not fence-off and erect signs indicating the location of the Dorob National Park along the road between Swakopmund and Arandis. The general public might enter the protected area unknowingly disturbing sensitive habitats.

COMMENTS BY THE AUDITEE

MINISTRY OF ENVIRONMENT AND TOURISM

“The Accounting Officer commented that the MET took a deliberate management decision not to fence off the park along the road between Walvis Bay and Henties Bay, however the warning signs to inform the public in this regard ought to be done when funds become available.”

4.4.5 Control of Pollution into Coastal Rivers

The audit found that the DWAF under the MAWF issued Waste Water Effluent Disposal Exemption Water Permits (WWEDEP) to NAMDEB Senderlingsdrift mine without them providing evidence on the rerouting pipes to prevent the risk of discharging process water near the vicinity of the Orange River as indicated in its Integrated Water Management Plan for the Orange River Mines 2016, which is in contravention with paragraph 6.3 of the WWEDEP condition that requires records of reliable use of water to allow for the compilation of an effective water balance.

The audit found that the DEA under MET and the DWAF under MAWF did not control the activities of sand miners in the Swakop and Omaruru rivers located in Swakopmund and Henties Bay respectively to prevent land degradation.

Physical observations revealed oil spills on both riverbeds and old and non-functional trucks used for sand mining activities dumped and abandoned in the Omaruru River and developments along the bank of the river, as shown in the pictures (6-7) below.

Picture 6: Oil spills on the beds of the Swakop and Omaruru Rivers



Picture 7: Abandoned trucks and developments in and along the Omaruru River



COMMENTS BY THE AUDITEE

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

“The Accounting Officer commented that with regard to sand mining in the Swakop and Omaruru rivers, because this public streams are situated within the jurisdiction areas of the Swakop and Henties Bay municipalities respectively, these municipalities were given the authority to control the sand mining activities within their respective jurisdictions.”

CHAPTER 5: CONCLUSIONS

- 5.1 The Ministry of Environment and Tourism (MET) and key stakeholders are currently applying a fragmented sectoral approach to manage the coast in Namibia.
- ❖ MET and key stakeholders are not implementing the United Nations (UN) Sustainable Development Goals (SDGs) related to coastal management due to shortcoming in the existing laws and regulations.
- 5.2 Coastal local authorities did not provide evidence that climate change adaptation measures were implemented for existing and future infrastructural development close to the sea.
- 5.3 The Directorate Resource Management under the Ministry of Fisheries and Marine Resources (MFMR) did not provide evidence that measures were put in place for the impacts of climate change on the marine ecosystem.
- 5.4 The Department of Environmental Affairs (DEA) under MET did not ensure compliance to Environmental Management Plans of proponents and Organs of State at the coast.
- ❖ The DEA under MET did not ensure that listed activities as stated in paragraph 4.3.2 undertaken by proponents and organs of state at the coast are operating with Environmental Clearance Certificates (ECC's).
 - ❖ Key stakeholders of the MET issued authorization to proponents at the coast before obtaining an ECC.
- 5.5 The Directorate of Parks and Wildlife Management under MET did not effectively monitor the human impacts such as recreational activities in the Dorob National Park.
- 5.6 The Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) did not effectively verify the inspections conducted by Private ship Surveyors on fishing and mining registered ships.
- ❖ The audit could not determine the extent DMA conducted inspections on ships less than 25 tons, due to incomplete evidence provided and inconsistency in record keeping.
 - ❖ The DMA did not effectively inspect foreign ships during the calendar years 2013-2015.
- 5.7 The Directorate of Mines (DM) under the Ministry of Mines and Energy (MME) could not provide evidence that the deficiencies found during inspections were rectified by mining ships before departure to the sea.
- 5.8 The Directorate of Petroleum Affairs (DPA) under MME could not provide evidence to ascertain that inspections were carried out to ensure compliance with petroleum exploration licence conditions.

5.9 The Department of Water Affairs and Forestry (DWAF) under the Ministry of Agriculture, Water and Forestry (MAWF) did not ensure compliance with Sea Water Abstraction Permit conditions.

- ❖ The DWAF did not develop sea water quality standards for effluent disposal into the sea to avoid inconsistently measuring the effluent quality disposed into the sea.
- ❖ The DWAF did not effectively monitor the average dry weather flows of fishing, mining companies and coastal local Authorities.
- ❖ DWAF issued WVEDEP to a mining company to dispose sewage into the sea without complying with the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962.
- ❖ The DWAF also did not conduct inspections at all mining companies to ensure mines do not operate without Waste Water Effluent Disposal Exemption Water permits for effluent disposal into the sea

5.10 NAMPORT inspections at the ports did not prevent the re-occurrence of environmental incidents caused by tenants.

5.11 Swakopmund and Henties Bay Municipalities and Oranjemund Town Council have no waste management regulations.

- ❖ Walvis Bay and Luderitz Town Councils did not comply with their own waste management regulations.

5.12 The Directorate of Parks and Wildlife Management under MET did not fence off and erect signs indicating the location of the Dorob National Park east of Swakopmund.

5.13 DEA under MET and DWAF under MAWF did not control sand mining activities in the Swakop and Omaruru Rivers to prevent degradation.

CHAPTER 6: RECOMMENDATIONS

6.1 The Ministry of Environment and Tourism (MET) and key stakeholders should put measures in place to allow for an integrated sectoral approach to coastal management.

- ❖ The MET and key stakeholders should put measures in place on how to address shortcomings within existing laws and regulations related to the coastal management to ensure the effective implementation of the United Nations (UN) Sustainable Development Goals (SDGs).

6.2 Coastal local authorities should put measures in place to ensure the implementation of climate change adaptation measures for existing and future infrastructural development close to the sea.

6.3 The Directorate of Resource Management (DRM) under the Ministry of Fisheries and Marine Resources (MFMR) should conduct research to determine the impacts of climate change on the marine ecosystem and put measures in place to respond to the impacts thereof.

6.4 The Department of Environmental Affairs under MET should put measures in place to ensure proponents and Organs of State at the coast effectively comply with Environmental Management Plans.

- ❖ The DEA under MET should put measures in place to ensure that proponents and Organs of State undertaking listed activities at the coast operate with Environmental Clearance Certificates (ECC).

- ❖ The MET and key stakeholders should put measures in place to ensure that proponents operating at the coast obtain an ECC before issuing an authorization.

6.5 The Directorate of Parks and Wildlife Management (DPWM) under MET should put measures in place to ensure effective monitoring of human impacts in the Dorob National Park.

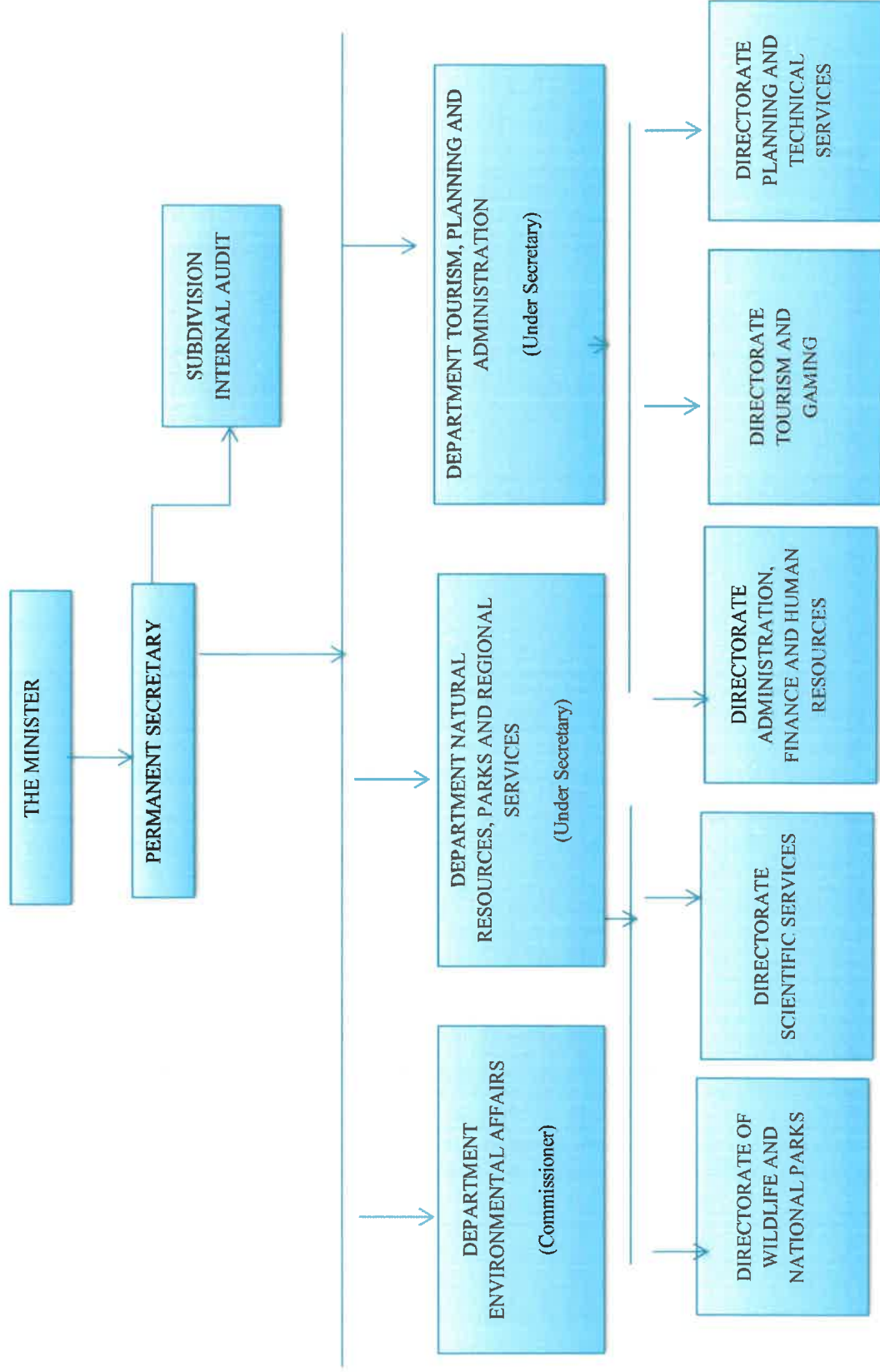
6.6 The Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) should put measures in place to effectively verify the inspections conducted by private ship surveyors on fishing and mining registered ships.

- ❖ The MWT should ensure that the DMA keep complete information and ensures consistency in record keeping for ships less than 25 tons.

- ❖ The DMA under MWT should also put measures in place to ensure foreign ships are effectively inspected.

- 6.7 The Directorate of Mines (DM) under the Ministry of Mines and Energy (MME) should put measures in place to ensure that deficiencies are rectified by mining ships before departure to the sea.
- 6.8 The Directorate of Petroleum Affairs (DPA) under MME should put measures in place to ensure that inspections are carried out to certify compliance with petroleum exploration licence conditions.
- 6.9 The Department of Water Affairs and Forestry (DWAF) under the Ministry of Agriculture, Water and Forestry (MAWF) should put measures in place to ensure compliance with Sea Water Abstraction Permit conditions.
- ❖ The DWAF should develop sea water quality standards for effluent disposal into the sea.
 - ❖ The DWAF should effectively monitor the average dry weather flows of fishing, mining companies and coastal Local Authorities.
 - ❖ DWAF should put measures in place to ensure that mining companies comply with the general standard quality restrictions as laid out in Government gazette r553 of 5 April 1962 for sewage disposal into the sea before issuing the WVEDEP.
 - ❖ The DWAF should effectively inspect mining sites at the coast to ensure that all the companies operate with Waste Water Effluent Disposal Exemption Water Permits for effluent disposals into the sea.
- 6.10 Namibian Ports Authority (NAMPORT) should put measures in place that will ensure that inspections conducted by them prevent the re-occurrence of environmental incidents caused by tenants.
- 6.11 Swakopmund Municipality, Henties Bay Municipality and Oranjemund Town Council should develop their own waste management regulations.
- ❖ Walvis Bay and Luderitz Town Council should comply with their own waste management regulations.
- 6.12 The Directorate of Parks and Wildlife Management under MET should fence off and erect signs indicating the location of the Dorob National Park along the road between Swakopmund and Arandis.
- 6.13 The DWAF under MAWF should put measures in place that will enable them to effectively prevent pollutions along the Orange River.
- 6.14 DEA under MET and DWAF under MAWF should put measures in place to control sand mining activities in the Swakop and Omaruru Rivers.

APPENDIX I: ORGANIZATIONAL STRUCTURE OF THE MET



APPENDIX II: ASSESSMENT CRITERIA; AUDIT QUESTIONS AND METHODOLOGY

Audit questions	Sub-questions	Assessment criteria
<p>1. To what extent did the Government of the Republic of Namibia adopt laws and regulations for coastal management in accordance with the UN Sustainable Development Goals (SDGs)?</p>	<p>1.1 Are the laws and regulations for Coastal Management developed and adopted?</p> <p>1.2 Are these laws and regulations effective to achieve the UN Sustainable Development Goals?</p>	<p>It is a best practice that Namibia's laws and regulations are aligned to the Sustainable Development Goals adopted in September 2015, and are detailed as follows:</p> <p><u>Goal 16: Strong institutions</u></p> <p>(a) Promote the rule of law at the national and international levels;</p> <p>(b) Strengthen relevant national institutions, including through international cooperation.</p> <p><u>Goal 13: Climate action</u></p>
<p>2 What measures have MET and key stakeholders adopt to monitor and mitigate the impacts of climate change at the coast?</p>	<p>2.1 What goals and targets are adopted by MET for Climate Change at the coast?</p>	<p>(a) Integrate climate change measures into national policies, strategies and planning;</p> <p>(b) Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; and</p> <p>(c) Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</p> <p><u>Goal 14: Life below water</u></p>
	<p>2.2 What measures are adopted by the Ministry of Fisheries and Marine</p>	

	Resources (as a stakeholder) to combat the impacts of climate change on the marine ecosystem?	<p>(a) Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution;</p> <p>(b) Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.</p> <p>(c) Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels; and</p> <p><u>Goal 13: Climate action</u> Integrate climate change measures into national policies, strategies and planning.</p>
<p>3 What measures have MET and key stakeholders adopt to monitor coastal pollution and degradation?</p>	<p>3.1 How does the Department of Environmental Affairs (DEA) ensure compliance to Environmental Management Plans?</p> <p>3.1 How does the DEA ensure that fishing, mining and tourism listed activities taking place at the coast are undertaken in accordance with the provisions of Subsection 1 of Section 27 of the Environmental Management Act, 2007 (Act No.7 of 2007) operates with valid Environmental Clearance Certificate?</p>	<p><u>Goal 15: Life on land</u></p> <p>(a) Take urgent and significant action to reduce the degradation of natural habitats</p>
		<p>Subsection 3 of Section 26 of the Environmental Management Act, 2000 (Act 7 of 2007), states that, “the Environmental Commissioner monitor compliance with environmental plans and may-</p> <p>(a) Take any steps or make any inquiries the Commissioner considers necessary in order to determine if environmental implementation plans</p>

		<p>are being complied with by organs of the state; and</p> <p>(b) If, as a result of any steps taken or inquiry made under paragraph (a), the Commissioner is satisfied that an environmental implementation plan is not substantially being complied with, serve a written notice on the organ of state concerned, calling it to take such specified steps as the Commissioner considers necessary to remedy the non-compliance.”</p>
	<p>3.2 How does the DEA ensure that fishing, mining and tourism listed activities taking place at the coast are undertaken in accordance with the provisions of Subsection 1 of Section 27 of the Environmental Management Act, 2007 (Act No.7 of 2007) operates with valid Environmental Clearance Certificate?</p>	<p><u>Goal 15: Life on land</u></p> <p>(a) Take urgent and significant action to reduce the degradation of natural habitats.</p> <p>Subsection 1 of Section 27 of the Environmental Management Act, 2007 (Act No.7 of 2007) states that:</p> <p>(b) “The Minister, after following the consultative process referred to in section 44, may list, by notice in the Gazette, activities which may not be undertaken without an environmental clearance certificate.”</p> <p>Subsection 1 of Section 31 of the Environmental Management Act, 2007 (Act No. 7 of 2007) states</p>

		<p>that, “despite any other law to the contrary, a competent authority may not issue an authorization unless the proponent has obtained an Environmental Clearance Certificate.” Subsection 2 of Section 31 further states that, “An authorization issued contrary to subsection 1 is invalid.”</p>
	<p>3.3 How does the Department of Natural Resources, Parks and Regional Services ensure compliance to Coastal National Parks Management Plans?</p>	<p><u>Goal 15: Life on land</u></p> <p>(a) Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent the extinction of threatened species.</p> <p>According to Article 8 of the Convention on Biological Diversity, each Contracting Party shall, as far as possible and as appropriate:</p> <p>(a) “Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;</p> <p>(b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;</p> <p>(c) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, <i>inter alia</i>, through the development and implementation of plans or other management</p>

		<p>strategies;</p> <p>(d) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”</p>
		<p>According to the Dorob National Park Management Plan, “MET should monitor human impact of landscapes, ecosystems, habitats, and species with particular attention to fragile and high value components of the system, and human activities known to have significant impacts.”</p>
<p>3.4 What Flag State Control measures are implemented by the Directorate of Maritime Affairs (DMA) under the Ministry of Works and Transport (MWT) on ships of 400 tons gross tonnage and above for the prevention of oil pollution by fishing and mining ships?</p>		<p><u>Goal 6: Clean water</u></p> <p>(a) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials.</p> <p><u>Goal 14: Life below water</u></p> <p>(b) Prevent and significantly reduce marine pollution</p>

of all kinds.

According to the MARPOL Convention Annex I Regulation 4:

“Every oil tanker of 150 tons gross tonnage and above, and every other ship of 400 tons gross tonnage and above shall be subject to the surveys specified below:

- An initial survey before the ship is put in service or before the certificate is issued for the first time, which shall include a complete survey of its structure, equipment, system, fittings, arrangements and material in so far as the ship is covered by the convention;
- A renewal survey of intervals specified by the administration, but not exceeding 5 years;
- An intermediate survey within 3 months before or after the second anniversary date of the certificate; and
- An annual survey within 3 months before or after each anniversary date of the Certificate, including a general survey of the structure, equipment, systems, fittings, arrangements and material referred to in paragraph (1) (a) of this regulation to ensure that they have been maintained

		<p>in accordance with paragraph (4) of this regulation and that they remain satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the Certificate issued under regulation 5 or 6 of this Annex.</p>
<p>3.5 What measures were developed by the DMA to control ships less than 400 tons gross tonnage for the prevention of oil pollution by fishing and mining ships?</p>		<ul style="list-style-type: none"> ● The Administration shall establish appropriate measures for ships which are not subject to the provisions of paragraph (1) of this regulation in order to ensure that the applicable provisions of this Annex are complied with.
		<ul style="list-style-type: none"> ● In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and inspection and shall undertake to ensure the necessary arrangements to satisfy this obligation.”
	<p>3.6 What Port State Control measures are implemented by the DMA to achieve inspection targets to monitor foreign ships?</p>	<p><u>Goal 6: Clean water</u> (a) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials. <u>Goal 14: Life below water</u> (b) Prevent and significantly reduce marine pollution of all kinds. According to the MARPOL Convention Annex 1, regulation 8A:</p>

- (1) “A ship when in a port or an offshore terminal of another Party is subject to survey by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by oil.
 - (2) In the circumstances given in paragraph (1) of this regulation, the party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this convention.”
- According to the Abudja Memorandum of Understanding, paragraph 1.3 of section 1 “Each Authority will achieve, within a period of 3 years from the coming into effect of the Memorandum an annual total inspections corresponding to 15% of the estimated number of individual foreign merchant ships, hereinafter referred to as “ships”, which entered the ports of its State during a recent representative period of 12 months. The Committee established pursuant to Section 7.1 will monitor the overall inspection activity and its effectiveness throughout the region. The Committee will also adjust the target inspection rate based on experience gained and progress made in the implementation of the

		Memorandum of understanding.”
	<p>3.7 How does the DWA ensure compliance to the Water Abstraction Permits conditions?</p>	<p><u>Goal 6: Clean water</u> (a) Ensure sustainable withdrawals and supply of freshwater to address water scarcity</p> <p>According to Subsection 1 of section 12 of the Water Act, 1956 (Act No.54 of 1956) “Except under the authority of a permit issued by the Minister and in accordance with any condition subject to which such permit was issued, no person shall in connection with any undertaking use a quantity of water for industrial purposes exceeding during any day 150 cubic metres. (2) An application for a permit under subsection (1) shall be in such form and shall include such particulars as may be prescribed by regulation under section 26.</p>
	<p>3.8 How does the DWA ensure compliance to the Waste Water Effluent Disposal Exemptions Permit conditions?</p>	<p><u>Goal 6: Clean water</u> (a) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.</p> <p><u>Goal 14: Life below water</u> (b) Prevent and significantly reduce marine pollution of all kinds, in particular from land-based</p>

activities.

Subsection 1 of Section 22 of the Water Act, 1956 (Act No. 54 of 1956) states that, "A local authority having jurisdiction over the disposal of sewage may, after purifying the effluent derived from the treatment of such sewage in accordance with standards prescribed under subsection 1 of section 21 and with the permission of the Minister use such effluent for any purpose approved by the Minister or disposed of such effluent for use by any person or discharge such effluent in a public stream.

(2) the Minister may in writing, and on such conditions as he might deem exempt from compliance with the provisions of section 21, any local authority which does not dispose of water used for any industrial purpose other purification or disposal of sewage."

Subsection 1 (a) of Section 21 states that, "The purification of any waste water or any effluent or waste produced by or resulting from the use of water for industrial purposes shall form an integral part of the process of such use and, subject to the provisions of sub-section (5), any person using water for industrial purposes shall purify such water, effluent or waste so as to conform to such requirements as the Minister may from time to time after consultation

with the South African Bureau of Standards, prescribe by notice in the Gazette(See *Government Gazette regulations r553 of 1962*) either generally or in relation to water used for or in connection with any one or more specified industrial purposes or in relation to water derived from any specified public stream or in relation to water used in any prescribed area.

- (c) Any requirements prescribed under paragraph (a) shall be such as to ensure that the waste water, effluent or waste to which such requirements relate will, after purification in accordance with those requirements, be at least as free of impurities as would have been the case if the purification thereof had been effected in accordance with the recommendation of the said Bureau.”

Subsection 1 of section 22 states that, “Any person who has control over land on which anything was or is done which involved or involves a substance capable of causing water pollution, whether such substance is a solid, liquid, vapour or gas or a combination thereof, shall take such steps as may be prescribed by regulation under section 26 in order to prevent- (a) any public or private water on or under that land, including rain water which falls on or flows

		<p>over or penetrates such land, from being polluted by that substance, or if that water has already been polluted, from being further polluted by that substance; and (b) any public or private water on or under any other land, or the sea, from being polluted, or if that water has already been polluted, from being further polluted, by water referred to in paragraph (a) which became polluted in the circumstances described in that paragraph.”</p>
	<p>3.9 How does the DWA ensure compliance to the Government Gazette r553 of 1962?</p>	<p><u>Goal 6: Clean water</u> (a) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.</p> <p><u>Goal 14: Life below water</u> Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities</p> <p>According to the Government Gazette R553 of 1962, “it is hereby notified that the Minister of Water Affairs has, in terms of paragraph (a) of subsection (1) of section 21 of the Water Act, 1956 (Act No. 54 of 1956) prescribed the following requirements to which waste water or effluent, produced by or resulting from the use of water for</p>

	<p>3.10 How does Directorate of Mines (DM) under the Ministry of Mines and Energy ensure compliance to Mining License Conditions relating to environmental protection?</p>	<p>industrial purposes, shall conform after purification” (see Annexure I).</p> <p><u>Goal 6: clean water</u> (a) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials.</p> <p><u>Goal 15 life on land</u> (b) Take urgent and significant action to reduce the degradation of natural habitats</p> <p>Subsection 1 of Section 5 of the Minerals (Prospecting & Mining) Act, 1992 (Act no. 33 of 1992) states that, “the Commissioner or any officer who is engaged in carrying out the provisions of this Act and who has been authorized thereto by the Commissioner may, in order to exercise any power or perform any duty or function conferred or imposed by this Act-</p> <p>(a) “At all reasonable times enter any land or place where any reconnaissance operations, prospecting operations or mining operations have been, or are to be carried on, including any accessory works, or land to which any such operations or accessory works relate;</p> <p>(b) Take or remove, for purposes of</p>
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		<p>mineralogical examination, assaying, test work or marketability surveys from:</p> <p>(i) any land, place or accessory works referred to in paragraph (a), any sample of any mineral or group of minerals; or</p> <p>(ii) any such land, place or accessory works, a sample taken of any sample, or taken of any mineral or group of minerals won or mined, in the course of any operations referred to in paragraph (a);</p> <p>(c) seize any sample referred to in paragraph or any book, record or document which may in his or her opinion be used in evidence in connection with any offence in terms of this Act;</p> <p>(d) Inspect, make extracts from, and make copies of any book, record or document in relation to any operations or accessory works referred to in paragraph (a);</p> <p>(e) May make such investigations and inquiries as may be necessary to determine whether the provision of this Act or any term and condition, direction or order determined, given or made under this Act is being complied with.”</p>
	<p>3.11 How does the Directorate of Petroleum Affairs (DPA) under the</p>	<p>According to the Petroleum, (Exploration and Production),1991(Act No. 2 of 1991):</p>

MME ensure compliance to Exploration License Conditions relating to environmental protection?

“Subject to the provisions of Subsection (2), the Commissioner, the Chief Inspector or any officer who is engaged in carrying out the provisions of this Act and who has been authorized thereto by the Commissioner may, for the purposes of the administration of this Act:

(d) at all reasonable times enter any area, structure, vehicle, vessel, aircraft or building which has been, is or is to be used in connection with reconnaissance operations, exploration operations or production operations;

(e) inspect and test any machinery or equipment which has been, is or is to be used in connection with any of the operations referred to in paragraph (a);and

(f) Take or remove, for purposes of analysing or testing, samples of petroleum or other substances from any land where any operations referred to in paragraph (a) are being carried out.

Subsection 2 Section 38 further states that:

Without derogating from the generality of subsection (1), the holder of an exploration licence shall –
(c) “control the flow and prevent the waste, escape or spilling in the exploration area of petroleum, water or any gas;

		<p>(d) prevent the waste or spilling in the exploration area of water or drilling fluid or water and drilling fluid or any other substance extracted from a well drilled for purposes of or in connection with exploration operations or used in relation to the drilling of such a well; and</p> <p>(e) furnish to the Commissioner prior to the drilling of any well a report containing particulars of the technique to be employed, an estimate of the time to be taken, the material to be used and the safety measures to be employed in the drilling of such well.”</p>
	<p>3.12 How does NAMPORT ensure effective monitoring of industrial waste generated at the ports?</p>	<p><u>Goal 6: clean water</u></p> <p>(c) Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials.</p> <p><u>Goal 15 life on land</u></p> <p>(d) Take urgent and significant action to reduce the degradation of natural habitats</p> <p>According to the job description of a Safety, Health, Risk, Environment and Quality (SHREQ) officer from Namport, the key responsibilities of a SHREQ officer are:</p> <ul style="list-style-type: none"> • Conduct environmental, health and safety inspections at NAMPORT, Stevedoring companies, contractors and other port users;

- Inspect tenant facilities;
- Inspect port user activities,
- Identify and monitor hazardous processes to determine exposures;
- Enforce legislative and operational regulations;
- Control the adherence of ships in the port to pollution prevention requirements;
- Disposal of recovered pollutants and contaminated, etc.

The above responsibilities will therefore ensure the implementation of the following of Port regulation 117 of 2001 which states that, "No person shall throw, discard, discharge or deposit or allow be throwing, discarding, discharging or depositing within a port any article, material or liquid which is liable to cause an obstruction, danger, pollution or nuisance."

According to the NAMPORT Environmental Legal Register part 4 section 15 "If NAMPORT uses a person/company other than the Council to collect and dispose of industrial waste, it must notify the Council of its intention to do so and ensure the person/company complies with the conditions applied thereto."

	<p>3.13 How has coastal local authorities' ensured compliance to their own Waste Management Regulations?</p>	<p><u>Goal 15: Life on land</u></p> <p>15.5 Take urgent and significant action to reduce the degradation of natural habitats.</p> <p>According to the subsection 1 (c) of section 94 of the Local Authority Act, 1992 (Act No. 23 of 1992) states that “a local authority council may, after the consultation with the Minister, make regulations by notice in the Gazette in relation to-</p> <p>The provision, regulation and control for the removal of disposal of night soil, refuse, lop water, garden and stable litter and otherwise offensive or unhealthy matter.”</p>
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APPENDIX III: PHYSICAL OBSERVATIONS CONDUCTED

<u>Mining Activities</u>	<u>Region</u>
1. The Salt Company (Pty) Ltd	Swakopmund, Erongo Region
2. Walvis Bay Salt Holdings (Pty) Ltd	Walvis Bay, Erongo Region
3. NAMDEB	Oranjemund, Karas Region
<u>Desalination Plant</u>	<u>Region</u>
4. Areva Desalination Plant	Wlotzkabaken, Erongo Region
<u>Coastal Rivers</u>	<u>Region</u>
5. Swakop River	Swakopmund, Erongo Region
6. Omaruru River	Henties Bay, Erongo Region
7. Orange River	Oranjemund, Karas Region
<u>Fishing Factories</u>	
8. Merlus	Walvis Bay, Erongo Region
9. Seaflower	Luderitz, Karas Region
10. Etosha	Walvis Bay, Erongo Region
<u>Infrastructural Developments close to the sea</u>	<u>Regions</u>
11. Swakopmund	Erongo Region
12. Walvis Bay	Erongo Region
13. Henties Bay	Erongo Region
14. Luderitz	Karas Region
15. Oranjemund	Karas Region
<u>Ports</u>	<u>Regions</u>
16. Namport, Walvis Bay	Erongo
17. Namport, Luderitz	Karas
<u>Town Waste Water Treatment Plants</u>	<u>Regions</u>
18. Swakopmund	Erongo
19. Walvis Bay	Erongo
20. Luderitz	Karas
21. Oranjemund	Karas
<u>Town Land Fill/Dump Sites</u>	<u>Regions</u>
22. Swakopmund	Erongo
23. Walvis Bay	Erongo
24. Henties Bay	Erongo
25. Luderitz	Karas
26. Oranjemund	Karas
<u>Ships</u>	<u>Regions</u>
27. Muxia	Walvis Bay, Erongo Region

28. Noordburg Kalapuse	Walvis Bay, Erongo Region
<u>Tourism</u>	
29. Recreational Activities	Swakopmund, Erongo Region
30. Lichen Fields	Henties Bay, Erongo Region

APPENDIX IV: INTERVIEWS CONDUCTED

Number	Position	Region
Ministry of Environment and Tourism (MET)		
1.	Chief Conservation Scientist: Environment Monitoring	Khomas
2.	Deputy Director & Senior Conservation Scientist (Focus Group): Multilateral	Khomas
3.	Chief Conservation Scientist & Conservation Scientist (Focus Group): Waste Management and pollution Control	Khomas
4.	Control Warden Officer: Directorate of Parks and Wildlife Management	Erongo
5.	Warden Officer (Focus Group)	Erongo
Stakeholders		
Ministry of Works and Transport (MWT)		
5.	Acting Director: Directorate of Maritime Affairs	Khomas
6.	Deputy Director: Directorate of Maritime Affairs	Erongo
7.	Ship Surveyor (Focus Group) Directorate of Maritime Affairs	Karas
Ministry of Fisheries and Marine Resources		
8.	Deputy Director: Resources Management	Khomas
Ministry of Urban and Rural Development		
Swakopmund Municipality		
9.	General Manager and Manager (Focus Group): Health Services	Erongo
10.	Environmental Practitioner and Engineer (Focus Group): Health Services and Engineering	
Henties Bay Municipality		
11.	Environmental, Health and Safety Practitioner and Environmental, Health and Safety Assistant Practitioner	Erongo
Oranjemund Town Council		
12.	Technical Manager: Infrastructure & Technical Services	Karas
Luderitz Town Council		
13.	Environmental Officer and Head of Health, Sewage and Environment	Karas
NAMPORT		
14.	Environmental Manager	Erongo
Sea Flower Fishing Company (Pty) Ltd		
15.	Production Manager and Quality Assurance Manager (Focus Group)	Karas
Salt Co (Pty) Ltd Cape Cross		
16.	Administration Manager	Erongo

APPENDIX V: DOCUMENTS ANALYZED

Number	Document Analyzed	Information Obtained
1	Minerals (Prospecting & Mining) Act. No. 33 of 1992	Criteria
2	The Environmental Management Act. No. 7 of 2007	Criteria
3	The Minerals Policy of 2002	Criteria
4	Amendment of regulations relating to Nature Conservation: Nature Conservation Ordinance, 1975	Criteria
5	Declaration of Dorob National Park as a game park: Conservation Ordinance, 1975	To determine whether the Dorob National Park is declared a game park
6	Convention on Biological Diversity	Criteria
7	The National policy on Coastal Management for Namibia	Criteria
8	Management Plan Dorob National Park	Criteria
9	Management Plan Sperrgebiet National Park	Criteria
10	Petroleum Products Regulations: Petroleum Products and Energy Act, 1990	Criteria
11	The Water Act, No. 54 of 1956	Criteria
12	Government Gazette R553	Criteria
13	Merchant Shipping Act 57 (Act No.57 of 1951)	Criteria
14	Constructions and Equipment Regulation for Fishing Vessels	Criteria
15	MARPOL International Convention for the Prevention of Pollution from Ships	Criteria
16	Municipality of Henties Bay Seashore Regulation	Criteria
17	Namibian Ports Authority Act 2 of 1994	Criteria
18	Namport Legal Register 2015	Criteria and also to determine whether Namport effectively ensure compliance to laws and regulation relating to the protection of the environment.
	2030 Agenda for Sustainable Development	To determine the relevant Sustainable Development Goals (SDG's) relating to Coastal Management and to determine whether the current laws and regulations of Coastal Management is in line with the SDG's.
19	Water Permit Conditions of Sand	To determine if the conditions attached to

	Miners	permit are adequate to protect the environment from pollutions and whether a small-scale sand miner is obligated to rehabilitate the environment.
20	Environmental Clearance Certificates	To determine whether the DEA under MET ensured that proponents undertaking listed activities impacting the environment at the coast operates with valid Environmental Clearance Certificates.
21	Environmental Management Plans	To determine whether the DEA under MET ensured proponents undertaking listed activities impacting the environment at the coast complies with Environmental Management Plans.
22	Environmental Management Reports	To determine whether the DEA under MET conducted verification inspections to ensure that the Environmental Management Reports of proponents undertaking listed activities impacting the environment at the coast is a true reflection of operations.
23	Waste Water Effluent Disposal Exemption Permits	To develop observation sheets for physical observations to determine whether fishing, mining and Local Authorities at the coast complies with Waste Water Effluent Disposal Exemption Permits.
24	Water Abstraction Permits	To develop observation sheets for physical observations to determine whether fishing, mining and Local Authorities at the coast complies with Water Abstraction Permit conditions.
25	Inspection Reports of Conservation Scientists, Mine Inspectors, Hydrologists and Coastal Local Authorities and Environmental Officers	To determine whether mining, fishing, recreational, shipping and waste disposal sites are effectively inspected by the MME, MAWF, MET and MWT.
26	Water Quality Reports of Coastal Mines, Local Authorities and Fishing Factories.	To determine whether the DWA under MAWF ensured that Coastal Mines, Local Authorities and Fishing Factories effectively complied with the water quality parameters of the Government Gazette Regulation R553 of 1962.
27	Job Descriptions of Conservation Scientists, Warden's, Hydrologists, Mine Inspectors, Ship Surveyors, Petroleum Inspectors and Coastal Local Authorities Environmental Officers.	To determine the roles and responsibilities of key staff of the MET, MME, MWT and Coastal Local Authorities.
28	Water Abstraction Permit Register	To determine whether the DWA under MAWF effectively recorded the water abstraction returns of Mining and Fishing Activities thereby ensuring compliance to

		Water Abstraction Permit Conditions.
29	Ministry of Mines Vessel Register	To determine whether the DM under the MME effectively recorded all mining vessel and also whether this reconciles with inspection reports and annual operational plans.
30	DM under MME Annual Operational Plans	To determine whether the DM under MME effectively execute annual inspections as stated by the Annual Operational Plan.
31	Budget Book	To determine the staff establishment of the key Departments under MET.
32	Report of the Auditor-General on the Accounts of the MET	To determine the budget allocations of the DEA under MET.
33	Walvis Bay Climate Change Strategic Action Plan	To determine whether the Municipality have an approved Climate Change Action Plan in place and if it is implemented.
34	Sea-Level Rise in Namibia's Coastal Towns and Wetlands Reports: Projected Impacts and Recommended Adaptation Strategies prepared by Lithon Projects Consultants	To determine whether Coastal Local Authorities have developed adaptation strategies towards Climate Change and also to identify the costs of not implementing Climate Change Adaptation Strategies as described by the report.
35	Maps of Coastal Towns	To determine whether Coastal Local Authorities have indicated sensitive areas on Coastal Town Maps where developments are not allowed.
36	National Policy on Climate Change For Namibia 2011	To determine the extent the National Policy for Climate Change 2011 is implemented by the MET.
37	Namibias' Second Biodiversity Strategy and Action Plan 2013-2022	To determine whether the MET have implemented the Biodiversity Strategy and Action Plan during 2013/14-2015/16

APPENDIX VI: SECTION 44 OF THE ENVIRONMENTAL MANAGEMENT ACT, 2007, (ACT NO. 7 OF 2007)

“When in terms of this Act the Minister or the Environmental Commissioner is required to consult, the Minister or the Environmental Commissioner, as the case may be –

(a) must consult the organ of state whose area of responsibility may be affected by the performance of the function or duty or the exercise of the power; and

(a) may, where appropriate, consult any other interested or affected person.

(2) When in terms of this Act the Minister or the Environmental Commissioner is required to consult any person or organ of state, such consultation is regarded as having been satisfied if a written notification of intention to act has been made to that person or organ of state and no response has been received within a reasonable time.”

APPENDIX VII: SUB-SECTION 5 OF SECTION 21 OF THE WATER ACT, 1956, (ACT NO.54 OF 1956)

“5 (a) Any person or user referred to in sub-section (1) or (2) may apply to the Minister for a permit exempting him from compliance with the provisions of either of those sub-sections, and the Minister may, after such investigation as he may consider necessary, if he is satisfied that compliance with the said provisions is impracticable in the particular circumstances, grant a permit subject to such conditions as he may deem fit to impose, exempting such person or user from compliance therewith to such extent as the Minister may determine, or authorizing such person or user to discharge any water, effluent or waste referred to in sub-section (1) in an unpurified state or in such state of semi-purification as the Minister may determine, into any public stream at a point to be fixed by the Minister: Provided that, in the case of an application for exemption from compliance with the provisions of sub-section (1), the Minister shall in considering such application have due regard to the regulations made under paragraph (d) of subsection (1) of section *ten* of the Sea-shore Act, 1935 (act No.21 of 1935), and shall not issue a permit unless he is satisfied that-

- (i) the conditions to be imposed in connection with any such permit will be at least as effective for the purpose of preventing the pollution of public or other water, including sea water, as any conditions or requirements which may have been recommended by the South African Bureau of Standards; and

- (ii) (ii) any point so fixed by him is in such proximity to the sea that it is unlikely that any other person will be prejudicially affected and that the dilution of such waste water, effluent or waste by sea water or other water contained in the said stream will be such that neither aquatic nor marine fauna or flora in the public stream or the sea will be detrimentally affected.
- (b) Any interested person, other than an applicant for a permit under paragraph (a), may after written notification to the Minister apply to a water court for the cancellation or modification of any permit issued under that paragraph, and the water court may make such order on the application as it may consider equitable.
- (c) The Minister may at any time by notice in writing to the holder of any permit issued in terms of paragraph (a), withdraw that permit or amend it in such manner as he may deem fit.

APPENDIX VIII



DEPARTMENT OF WATER AFFAIRS AND FORESTRY

GENERAL STANDARD QUALITY RESTRICTIONS AS LAID OUT IN GOVERNMENT GAZETTE R553 OF 5 APRIL 1962

Parameter	Unit	Maximum allowable levels
pH		5.5% – 9,5%
Dissolved oxygen	mg/l	should be at least 75% saturation
Typical faecal E.coli	MPC	no typical E.coli should be counted/100ml
Temperature	°C	35
Chemical oxygen demand	mg/l as COD	75
Oxygen absorbed	mg/l as OA	10
Biological oxygen demand	mg/l	no value given
Total dissolved solids	mg/l as TDS	should not increase more than 500 mg/l above intake water
Total suspended solids	mg/l TSS	25
Sodium	mg/l as Na	should not increase more than 90 mg/l above intake water
Fats, oil and grease		2.5 (Gravimetric method)
Chlorine, residual	mg/l as Cl	0.1
Free and saline ammonia	mg/l as N	10
Arsenic	mg/l as As	0.5

Boron	mg/l as B	1.0
Chromium, hexavalent	mg/l as Cr (VI)	0.05
Chromium, total	mg/l as Cr	0.5
Copper	mg/l as Cu	1.0
Lead	mg/l as Pb	1.0
Sulphide	mg/l as S	1.0
Fluorine	mg/l as F	1.0
Zinc	mg/l as Zn	5.0
Phenolic compounds	mg/l as phenol	0.1
Cyanide and related compounds	mg/l as CN	0.5

APPENDIX IX: NAMPORT LEASE AGREEMENT

18. “ Safety, health, risk, environmental quality (SHREQ) Management

18.1 The Tenant shall at all times accept and recognize the landlord’s commitments towards improved SHREQ performance and business efficiencies, by acquainting itself and adhering to the existing SHREQ policies, relevant laws and regulations as may be reviewed or amended from time to time. The Tenant reliable to always ensure that all its activities are consistent with the landlord’s SHREQ goals, practices and procedures as well as to participate and cooperate during the performance of an SHREQ site assessment prior to the effective date of the Lease to stablish the SHREQ standards that the Tenant will be subject to throughout the Lease.

18.2 In terms of activities in the premises, the Tenant has the responsibility to act under all applicable national, local and Walvis Bay Port Regulations and to ensure that the activities meet with the existing SHREQ requirements and the prevailing SHREQ policies (particular the management policies) in respect of the property.

18.3 Pollution or Substandard Acts on the premises (or premises are adjoining the premises) or on any part of the property by any means by what so ever are strictly prohibited.

18.3.1 In the event that non-compliance with this requirement or any other relevant condition of the Lease is observed or SHREQ deficiencies are discovered on the premises or on any property adjoining or in the vicinity of the premises or on any part of the property that could be associated with the Tenant’s operational activities or proof of non-compliance of such SHREQ Management Policies, relevant laws and regulations is discovered, the landlord shall be entitled without prejudice to institute such breach procedures as may be appropriate under the circumstance, in terms of this agreements or any such procedure or penalties as may be prescribed or defined within the SHREQ Management Policies, relevant laws, Port and other regulations. Furthermore, the Tenant shall in terms of this clause 18, and at its own cost, provide efficient means to remedy the situation within such time as will be determined reasonable under the circumstances.

18.3.2 Failure to effectively execute such remediation strictly in compliance with the prescribed standard or Walvis Bay port and other relevant regulatory agency

guidelines, the landlord shall have the right to execute such remediation but on the cost of the Tenant.

- 18.4 The Tenant shall be responsible for its own security arrangement in respect of the premises.

**APPENDIX X: LAWS AND REGULATIONS THAT ARE RELATED
UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS FOR
COASTAL MANAGEMENT**

LAWS AND REGULATIONS	UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS
The Environmental Management Act, 2007, (Act No.7 of 2007)	Paragraph 15.5 of goal 15
The Minerals (Prospecting and Mining) Act, 1992, (Act No.33 of 1992)	Paragraph 6.3 of goal 6 Paragraph 15.5 of goal 15
Petroleum (Exploration and Production) Act, 1991, (Act No. 2 of 1991)	Paragraph 6.3 of goal 6 Paragraph 15.5 of goal 15
The Water Act, 1956, (Act No.54 of 1956)	Paragraph 6.4 of goal 6 Paragraph 14.1 of goal 14
The Merchant Shipping Act, 1951, (Act No.57of 1951)	Paragraph 6.3 of goal 6 Paragraph 14.1 of goal 14
The Namibian Ports Authority Act, 1994, (Act No. 2 of 1994)	Paragraph 6.3 of goal 6 Paragraph 15.5 of goal 15
The Local Authority Act, 1992, (Act No.23 of 1992)	Paragraph 15.5 of goal 15

**APPENDIX XI: WATER ABSTRACTION FIGURES NOT RECORDED
ON ABSTRACTION PERMIT REGISTER**

No	Organization	Activity	Recorded on the Abstraction Permit Register (Yes/No)
1	Salt & Chemicals (Pty) Ltd	Mining	No
2	NAMDEB	Mining	Yes
3	Storm Mining (Pty)Ltd Diamond Company	Mining	No
4	J.L Erasmus	Not stated	No
5	Aqua Ero Enterprises	Not Stated	No
6	Uramin Namibia	Not Stated	No
7	Joe's Oyster Company (Pty) Ltd	Aqua Farming	No
8	Isis Auaculture	Aqua Farming	No
9	Areva Resources Namibia	Mining	No
10	Smartis Recoveries Diamond	Mining	No
11	Westport Resources Namibia (Pty) Ltd	Mining	No
12	LL Phosphate Namibia	Mining	No
13	Namibia Phosphate Marine	Mining	No
14	Debmarine Namibia	Mining	No
15	Etosha Fishing Corporation (Pty) Ltd	Fishing	No
16	Tunacor Limited Fisheries	Fishing	No
17	Seawork Processors (Pty)Ltd Fish	Fishing	No
18	Deep Ocean Processors (Pty) Ltd	Fishing	No
19	Zhong Mei Engineering (Pty) Ltd	Not Stated	No

Source: Sea Water Abstraction Permits Register of MAWF

APPENDIX XII-NO EVIDENCE PROVIDED OF QUALITY OF EFFLUENT COMPARED WITH SEA WATER QUALITY

Fishing Companies			
Number	Fish Factory	Region	Evidence Provided
1.	Cadilu Fishing	Erongo	No
2.	Novanam Factory	Erongo	No
3.	Merlus Factory	Erongo	No
4.	Hangana Factory	Erongo	No
5.	Abroma Factory	Erongo	No
6.	Gendev Factory	Erongo	No
7.	Pereira Factory	Erongo	No
8.	Benguella Sea Products	Erongo	No
9.	Deep Ocean Processors	Erongo	No
10.	Sea Flower Fish Factory	Karas	No
Mining Companies			
1.	The Salt Company (Pty) Ltd	Erongo	No
2.	Areva Desalination Plant	Erongo	No

Source: Records of the MAWF

APPENDIX XIII: AVERAGE DRY WEATHER FLOWS MONITORED BY DWA

Number	Mining, Fishing Companies and Local Authorities	Evidence of Average Dry Weather Flows Monitored
1.	Walvis Bay Salt Holdings (Pty) Ltd	No
2.	Swakopmund Municipality	No
3.	Walvis Bay Municipality	No
4.	The Salt Company (Pty) Ltd	No
5.	NAMDEB	No
6.	Etosha Fishing	No
7.	Cadilu Fishing	No
8.	Tunacor IQF Factory	No
9.	Novanam Factory	No
10.	Merlus Factory	Yes
11.	Hangana Factory	No
12.	Abroma Factory	No
13.	Gendev Factory	No
14.	Pereira Factory	No
15.	United Fishing Enterprise	No
16.	Benguella Sea Products	No
17.	Deep Ocean Processors	No
18.	Sea Flower Fish Factory	No
19.	Areva Desalination Plant	No

Source: Records of the MAWF

**APPENDIX XIV: EFFLUENT QUALITY DISPOSED INTO THE SEA BY
NAMDEB**

Parameter	Requirement	Actual Value
Dissolved Oxygen	75% saturation	3.5 mg/l
Ortho-Phosphate	<1.0 mg/litre	1.5 mg/l
Electrical Conductivity	<75mS/m	122.8 mS/m

Source: DAWF Technical Report 2014

Parameter	Requirement	Actual Value
Electrical Conductivity	<75mS/m	105.6 mS/m

Source: NAMDEB Chemical Water Analysis Report 31 August 2017

