ENVIRONMENTAL ASSESSMENT SCOPING REPORT

DETAILED DESIGN, BIDDING DOCUMENTATION AND SITE SUPERVISION FOR THE CONSTRUCTION OF ACCESS ROAD TO GCARUHWA CLINIC AND SCHOOL (21.7km)

Environmental and Social Management Plan (ESMP) report

MEFT APP-6473

Republic of Namibia
Ministry of Works and Transport

Proponent: Ministry of Works and Transport

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TERMS	DEFINITION
BID	Background Information Document
DR	District Road
EAP	Environmental Assessment Practitioners
EC	Environmental Consultant
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GHGs	Greenhouse Gasses
HEC	Helios Engineering Consultants
IMP	Impact Management Plan
ISO	International Organization for Standardization
I&APs	Interested and Affected Parties
MWT	Ministry of Works and Transport
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
RA	Roads Authority
RE	Resident Engineer
SHEQ rep	Safety, Health and Environmental Quality representative
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development

The **'Proponent** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e., Ministry of Works and Transport- Namibia.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

1. CHAPTER ONE: BACKGROUND

1.1. Overview

Access roads are crucial for connecting remote areas, facilitating construction and other projects, and supporting economic activities by improving transportation, accessibility, and safety. The Ministry of Works and Transport is hereby proposing to establish an access road off the B10 highway to Gcaruhwa Clinic and school. It is under Musese constituency\s area of jurisdiction and approximately 21.7 km in length. The proposal intends to improve the accessibility to education *(combined schools*), health *(clinics),* socio and economic amenities *(mahangu fields and shops).* Intended settlements to benefit from the proposed road are Siko, Muhama, Paranyime, Kayara and Gcaruhwa. The Musese constituency in Namibia's Kavango West Region has a population of *13,659* people thus The Namibia Statistics Agency 2023. Economic activity in this area is centred on communal livestock farming, tourism and integrated wildlife management. The administrative capital is the settlement of Rupara. According to Kavango West Regional profile, the Musese constituency was formed from the north-eastern part of the former Kahenge Constituency after the split of the Kavango Region in 2013.

The proposed access road came into consideration after the concerns over the accessibility to and from an established 24-Hour Emergency care Clinic at Gcaruhwa. These amenities offer a very vital health, social and economic benefits to the community and the newly sub-divided region of Kavango West which still needs development.

Construction of roads is a listed activity in the Environmental Management Act No 7 of 2007 as presented in table 1 below.

Table 1: Listed Activities -Environmental Management Act No. 7 of 2007

3: Mining and Quarrying Activities	**10: Infrastructure**
3.3 Resource extraction, manipulation, conservation and related activities	10.1 The construction of- (b) public roads

Furthermore, as per the requirements of the Environmental Management Act No. 7 of 2007, the proponent has appointed EnviroPlan Consulting cc to conduct an Environmental and Social Impact Assessment (ESIA) and develop an Environmental and Social Management Plan (ESMP) for the proposed project. This has been followed by an application for an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT), Directorate of Environmental Affairs (DEA).

In this respect, this Environmental Management Plan (EMP) document forms part of the application to be made to the DEA's office for an Environmental Clearance Certificate (ECC) for the proposed designs and site supervision for the construction of an access road and abstraction of road construction materials. The document is compiled in accordance with the guidelines and statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts assessment regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. The Environmental Consultant

Ministry of Works and Transport (MWT) has appointed Helios Engineering Consultants to design and supervise the proposed access road project (21.7km). Helios subsequently appointed EnviroPlan Consulting CC (EnviroPlan hereafter), on behalf of MWT, as the independent environmental consultant conducting the Environmental Assessment (EA) for the proposed activity.

Talent Nyungu, a qualified Environmental Assessment Practitioner (EAP) conducted this EA process. Tendai E Kasinganeti was the quality assurance and reviewing consultant for the project. The CVs of the consultants are attached as Appendix (iii) of the scoping report.

1.3. Project Location

The proposed access road will occur in Musese constituency, Kavango West region. It is under Maurus Nekaro Conservancy area of jurisdiction. All burrow pits to be identified and re habilitated will be within the constituency's area of influence. Economic activity in this area is centred on Mahangu cultivation, communal livestock farming and sustainable wildlife management (trophy hunting, crocodiles, hippopotamus and elephants). Gcaruhwa is located

approximately 75km from Nkurenkuru and the proposed road is approximately 21.7 km from the B10 Rundu-Nkurenkuru highway.

Please refer to the map overleaf (Fig 1) giving a locality layout of the site:

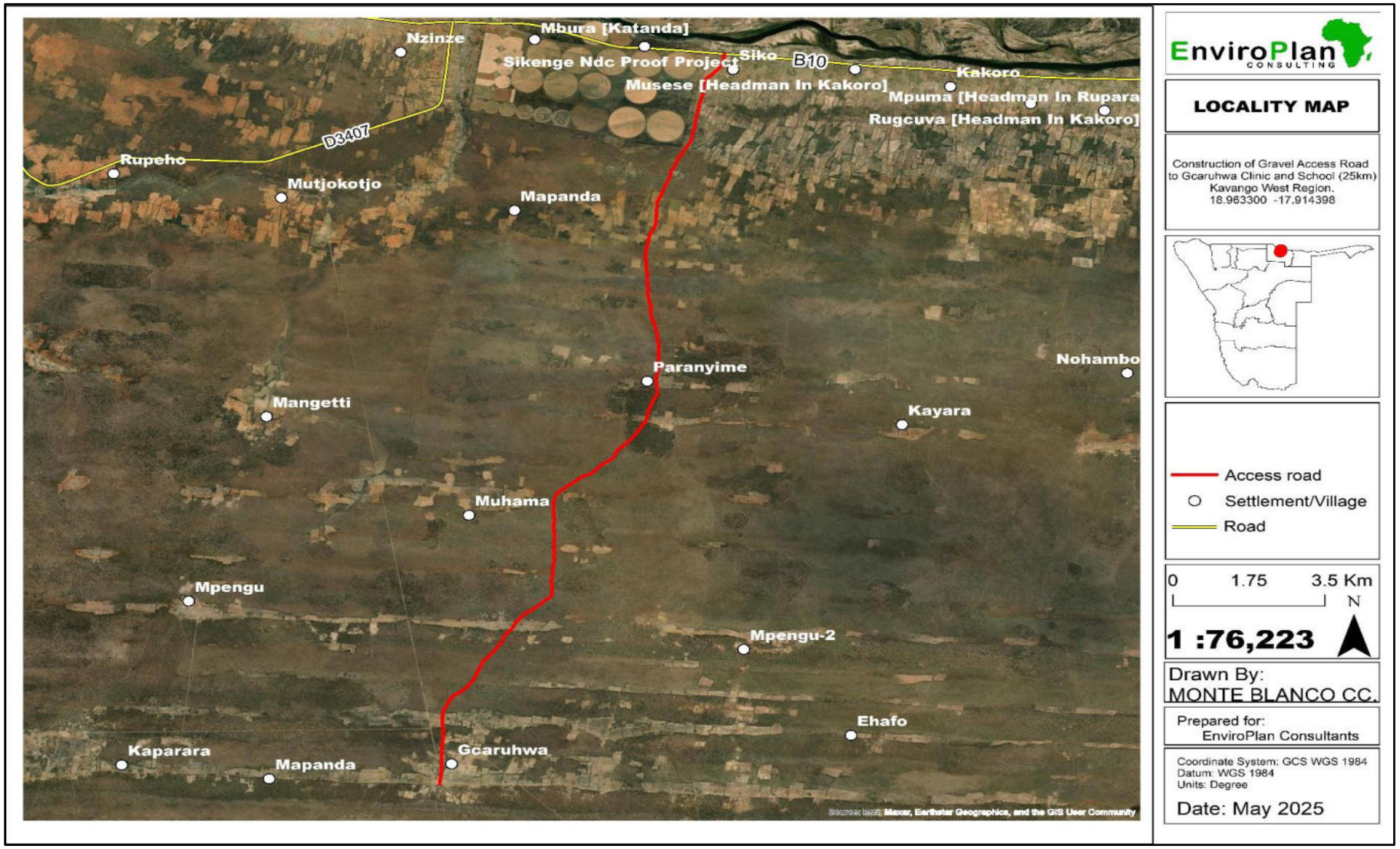

Figure 1: Access Road off B10 proposed access road route Locality

1.4. Description of existing road

According to a preliminary design report for the project by Helios Consulting Engineering (HEC) , the proposed road project is a direct link to the T1001 (B10), which is a major Regional Trunk Road that connects the Kavango Regions to the Trans-Zambezi corridor towards the East; and to the Northern Regions towards the West. The current existing earth track (4x4 drive) serves the Gcaruhwa Clinic and School and several surrounding settlements. Upon completion, it will play a vital role in enhancing regional infrastructure and connectivity, contributing to improved accessibility and economic development.

1.5. Materials Requirements

Construction materials for gravelling and construction will be obtained from borrow pits within the constituency. The consulting engineers will identify make sure the borrow pits will sustain the proposed activity. This will be done with the assistance of the Environmental consultant. The rehabilitation program will therefore be a mandate as soon as the proposed project is done. The abstraction of materials will be in a way that reduces the borrow pit slopes and allow for rehabilitation as well. A compliance inspection/ environmental audit will therefore be done prior to handover of the project to the project proponent.

1.6. Project Description

The proposed road construction will upgrade an existing sandy track to an all-weather Sprayco Armaseal LOCKCOTE preservative/rejuvenator which is a rapid setting water-based polymer bitumen compound designed to lock-in the chippings, seal and restore aged asphalt surfaces to prolong the life of asphalt pavements. Simple spray application of Armaseal penetrates and seals fine cracks while locks in the aggregates, sealing the asphalt surface, arresting oxidation of the existing bitumen binder and restoring the cohesion and stability of surface aggregate in the existing pavement.

Environmentally sensitive areas identified

The proposed access road is within a communal protected area that is Maurus Nekaro Conservancy since August 2017. The conservancy is one of the identified relevant stakeholders for the project. The conservancy gave consent to the construction of the road as discussed jointly with the Kavango West

Regional Council on a consensus meeting (please refer to meeting minutes and consent attached on the list of appendices). The project activities will directly impact the existing flora and fauna along the existing sandy track to be upgraded.

Identified Environmentally sensitive areas

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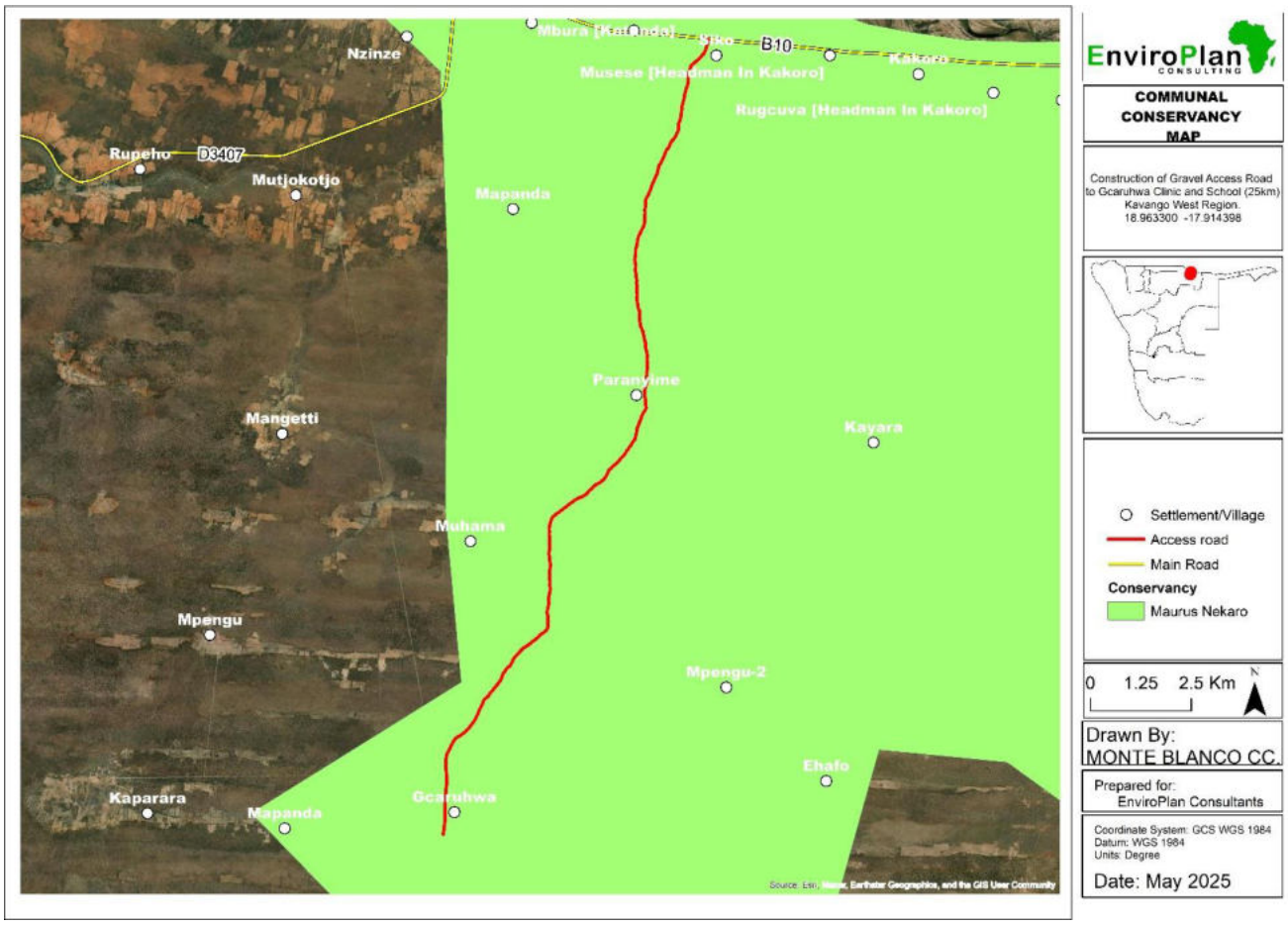

Figure 2: Communal- Conservancy Map.

Identified Socio-Economic issues

Socially, the proposed activities will impact the marginalized communities through employment opportunities, improved accessibility to key economic and health and social places. It is an infrastructural development project and by any means possible should be supported. The entire project will have a direct impact to five (5) settlements namely Siko, Kayara, Muhama, Paranyime and Gcaruhwa. The settlements have a breakdown of households as follows: Kayara (3), Paranyime (17), Muhama (11), Gcaruhwa (57) and Siko (220). From the beginning of the proposed access road to the end are existing houses, arable land, cattle kraals and a Church at Muhama that are likely to be affected by the proposed road and the alignment of the existing sandy track to Gcaruhwa.

1.6.1. Proposed road, Geometric design standards

The project designs will incorporate most applicable designs and standards as recommended by the Roads Authority (RA). Sprayco Armaseal technologies was chosen as the most appropriate design for the project site. Figure 5 below shows the cross section of the proposed road layout.

SprayCo Armaseal Polymer- Modified Bitumen Emulsion

Sprayco Aramaseal is a specialized sealing product used in road construction and maintenance. It is typically designed to protect and extend the life of surfaces layer. Below are the steps taken to incorporate Sprayco Aramaseal into road construction:

The process begins with the preparation and construction of the road structural layers, which include the roadbed, sub-base, and base layers. Apply a tack coat or penetration coat over the base surface to enhance the bonding between layers and improve aggregate adhesion. Follow this with the spreading of appropriate aggregates. Apply SprayCo Armaseal as the final surfacing treatment.

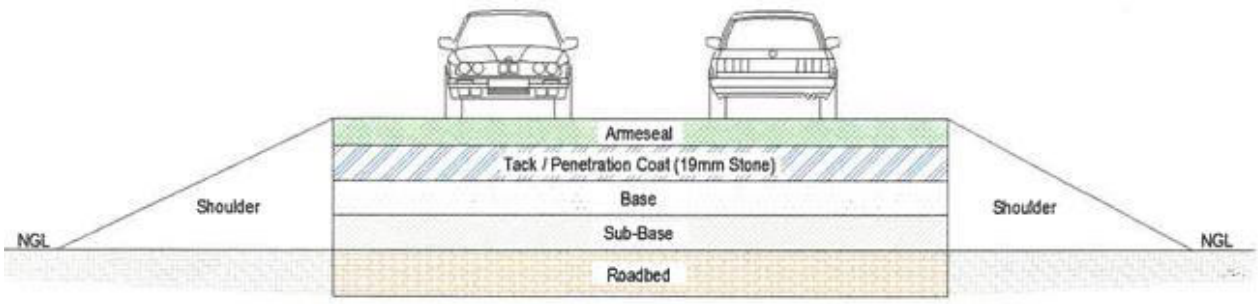

Figure 3: Proposed typical cross-section of road layers constructed with SprayCo Armaseal, (Adopted by HEC

According to RA, this polymer- modified bitumen emulsion acts as a sealant, effectively sealing surface cracks, preventing moisture ingres, and protecting the underlaying road layers from deterioration. The expected service life of Armaseal ranges from 5 to 10 years before requiring maintenance.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the ESMP is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in the project development and implementation. This section looks at the legislative framework within which the proposed project will operate under. The focus is on compliance with the legislation during the planning, construction and operational phases. All relevant legislation, policies and international statutes applying to the project are highlighted in Table 3 overleaf as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

The pursuit of sustainability by an Organisation is operationalised by a sound policy and legislative framework that gives operating parameters within its sphere of operation. In this section, relevant legal instruments, as well as their relevant provisions, are identified and analysed on their relevance to the proposed project. A concise explanation is given of the applicability of each of the identified pieces of legislation as well as how the Ministry of Works and Transport is supposed to implement environmental compliance to the project.

Table 2: Policies, legal and administrative regulations

Aspect	Legislation
The Constitution	Namibian Constitution First Amendment Act 34 of 1998
Archaeology	National Heritage Act 27 of 2004
	National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979
Environmental	Environmental Management Act 7 of 2007
	EIA Regulations GN 57/2007 (GG 3812)
	National Solid Waste Management Strategy
	Pollution and Waste Management Bill (draft)

Aspect	Legislation
	National Solid Waste Management Policy
	Soil Conservation Act 76 of 1969
	Hazardous Substance Ordinance (No. 15 of 1973)
	Atmospheric Pollution Prevention Ordinance, 1976
	National Policy on Climate Change for Namibia, 2010
	National Biodiversity Strategy and Action Plan (NBSAP2)
Forestry	Forest Act 12 of 2001
Water	Water Act 54 of 1956
	Water Resources Management Act, 2013 (Act No. 11 of 2013)
Health and Safety	Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work'.
	Public Health and Environmental Act, 2015
Services and Infrastructure	Road Ordinance 1972 (Ordinance 17 0f 1972)

Table 3: Polices, legal and administrative regulations

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the sustainable objectives which include: *Guarding against over utilization of biological natural resources,* *Limiting over-exploitation of non-renewable resources,* *Ensuring ecosystem functionality,* *Maintain biological diversity.*	Proposed activities can interfere with ecological processes. Attention should be given to the water resources and biodiversity.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia states Schedule 1: Screening list of policies/ plans/ programmes/ projects subject to environment must be accompanied by environmental assessments. “The development activities" are on that list.	The activity triggers an environmental impact assessment prior to commencement.
	The policy provides a definition to the term “Environment” broadly interpreted to include biophysical, social, economic, cultural, historical, and political components and provides reference to the	The proposed development requires the assessment of all possible environmental and social impacts to avoid, minimise or compensate environmental damage associated with the activities.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	inclusion of alternatives in all projects, policies, programmes, and plans.	
Environmental Management Act No. 07 of 2007	Requires that activities with significant environmental impact are subject to an environmental assessment process (Section 27). Requires for adequate public participation during the environmental assessment process stakeholders to give their opinions about a project (Section 2(b-c)). According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Section 3 (2) (b) states that "community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted and facilitated" is key. Section 3 (2) (e) states that "assessments must be undertaken for activities which may have a significant effect on the environment or the use of natural resources".	The nature of the proposed road construction and interrelated activities has potential to cause adverse environmental impacts to the surrounding environment. Activities such as excavation and trenching can cause significant environmental impacts. Therefore, proper assessments should guide project planning The EIA study considered full stakeholder participation. Stakeholder consultation was fully conducted. The proposed development is involving the utilisation of natural resources (water and land). Therefore, benefits from the implementation of the project must be shared equally. Environmental cost relating to project shall not be borne by communities found in the project area and surroundings. Project shall not commence without a valid environmental clearance certificate

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
EIA Regulations GN 57/2007 (GG 3812)	Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in an Environmental Scoping Report (GN No 30 S8) and an EIA report (GN No 30 S15).	The implementation of the project triggers the need for consultation of all affected and interested stakeholders regarding the development at all project development phases from planning to operation of the facility. A stakeholder and I&APs consultation meeting were held in respect to this, and all the concerns and issues were noted and addressed in this report.
The Water Act 54 of 1956	The Act was formulated 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.	The activities directly affecting water conservation, management and use therefore, requires the implementation of water conservation measures.
SANS 1929: 2005	Dust particulates from excavations /ore crushing that are smaller than 1mm are deemed dangerous to both plants and humans. As such a dust monitoring following the ASTM D1739 method should be used for monitoring dust emissions from any crushing plant anticipated.	A dust fallout monitoring plan can be instituted around project area

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	Dust chemical analysis and fallout quantities are specified for industrial and residential environs.	
Pollution Control and Waste Management Bill	The bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	The proposed activity triggers Section 21 and 22 of the bill. Activities such as excavations, primary road works may require the robust adoption of in-situ pollution mitigation measures. Contractors of the civil works of the project should make it mandatory that they manage their waste in a manner that do not cause environmental harm and risk both to the surroundings and the local communities.
Atmospheric Pollution Prevention Ordinance 11 of 1976	The law provides for the prevention of atmospheric pollution and for matters incidental thereto. The law regulates and prohibit pollution from industries particularly smoke and dust. The ordinance considers air pollution from point sources but does not address air quality standards,	Excavation activities will most likely affect ambient air quality. Efforts to suppress and monitor dust should be adopted as recommended in the ESMP.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Solid Waste Management Strategy	The Strategy ensures that the future directions, regulations, funding, and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders. Waste disposal presents a challenge to solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	Mining activities can potentially generate significant amount of waste material that need careful management. The obligation to meet waste management objectives should be tolerated by both proponent and contractors. The proponent should limit the exposure of waste to the natural environment and surrounding. In-situ waste management plans should be adopted and implemented prior the commencement of operations. Rock waste and other non-mineral waste should be stored and disposed in an environmentally friendly manner. Waste should be carted away to licences waste disposal sites.
Soil Conservation Act 76 of 1969	The Act established to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of the water sources in the Republic of Namibia.	The construction of auxiliary infrastructure such as access roads or tracks to borrow pits should include systems and mechanism for preventing erosion.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	Mitigation measures should be provided for if the road and traffic impacts cannot be avoided. Should the proponent wish to undertake activities involving road transportation or creation new access adjoining national roads, relevant permits will be required from the Ministry of Works and Transport
Forest Act 12 of 2001	Section 10 (1) set out the aim of the forest management as to: The purpose for which forest resources are managed and developed, including the planting of trees where necessary in Namibia is to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment.	The proposed project will likely result in the disturbance of indigenous vegetation of conservation significance including the disruption of biological processes. The is an existence of both protected and unprotected Flora along the proposed road route. Harvesting/ de-bushing operations for clearing up for the road construction activities should be following the Forestry permitting and requirements.
	(b) Any living tree, bush or shrub growing within 100 metres of a river, stream, or watercourse.	The project will not result in the removal of living trees, bushes and shrubs growing within 100m of a river, stream, or watercourse.
	(2) A person who wishes to obtain a licence to cut and remove the vegetation referred to in subsection (1) shall, in the prescribed form and manner, apply for the licence to a licensing officer who has been	The removal of trees in the above instances would require the contractors or sub-contractors to acquire necessary forestry permits first.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	designated or appointed for the area where the protected area is situated.	
National Policy on Climate Change for Namibia (2011)	The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation."	Measure should be adopted by MWT (proponent) to prevent or minimise toxic emissions into the atmosphere. Dust suppression and monitoring will be employed, to ensure those air quality objectives tied to climate change mitigation are met.
National Climate Change Strategy & Action Plan 2013 – 2020	The Strategy outlines Namibia's response to climate change. The strategy aims to address and plan for action against climate change, both through mitigation and adaptation actions. In its adaptation strategy, the Strategy recognises the role of a sustainable water resource base.	The development should adopt measures that strengthen sustainable utilization of water resource. The implementation should be very careful on not to cause harm to the available water resources but improve the management through various conservation technics.
	The Strategy proposed strategies that aim to: Strategic Aim 1: Further improve the overall climate change understanding and related policy responses in water resources sector. Strategic Aim 2: Monitoring and data collecting technologies of surface and underground water are developed and implemented at basin/watershed level.	The proponent should invest capital on strengthening climate change and adaptation through cleaner production systems implementation. Certification by international standards such as ISO14001 can help with climate sustainability, and is recommended.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Nature Conservation Ordinance (1996)	This ordinance relates to the conservation of nature; the establishment of game, parks, and nature reserves; the control of problem animals; and highlights matters incidental thereto.	The activities of the project are highly localized. It is most likely that project activities will interfere with nature reserves within the conservancy. However, there is need for proper education and awareness against poaching and make sure all activities are not in conflict with the provisions listed in the Nature Conservation Ordinance. All species of birds are protected except the game birds mentioned in *Schedule 6* which can be hunted.
National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022	The action plan was operationalized in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	The proposed project during construction potentially triggers ecosystem threats from pollution. As such mechanisms for environmental compliance and monitoring will be put in place, ultimately aimed at protecting biodiversity.
Labour Act 11 of 2007.	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47).	Proposed access road will require significant amount of laborious work. Therefore, there is need to ensure that proponent ensures employees a working environment that is safe, and adequate facilities provided for the upkeep of employee welfare standards. The Ministry of Labour and Safety demands that a health management policy will be drafted and instituted.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety requirements.	-Occupational health and safety provisions during construction and operational phases should be clearly outlined.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
		-Compliance monitoring and responsibilities for compliance monitoring should be clearly stated
Public Health Act 36 of 1919	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	Compliance to the Public Health Act will be ensured in relation to the following: - Sanitation facilities -Communicable diseases -Emergency healthcare provision - COVID 19 workplace measures
Public and Environmental Health Act 1 of 2015.	To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	
National Heritage Act 27 of 2004	Section 48(1) states that "A person may apply to the (Heritage) Council for a permit to carry out works or activities in relation to a protected place or protected object" Protects and conserves cultural heritage and cultural resources with special emphasis on places and sources of National heritage including graves, artefacts, and any objects older than 50 years.	The project will encompass upgrading an existing sand track to a standard all-weather road. However, if heritage resources (e.g., human remains etc.) discovered during implementation, guidelines dictate that a permit be acquired from the National Heritage Council of Namibia for relocation of any artefacts or specimen.

3. CHAPTER THREE: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

3.1. Expected Social and Environmental Impacts

From previous experience with developments of this nature and comments received from Interested and Affected Parties (I&APs), establishing a low volume bitumen seal road might have the following key impacts on the receiving environment:

Socio-economic impacts:

- Additional employment will be created during construction and operation
- Noise and dust pollution from construction operations.
- Improved access to marginalized communities residing in Siko, Kayara, Muhama, Paranyime and Gcaruhwa settlements.
- Community health issues
- Increase in criminal activities
- Cultural/heritage impacts
- Increase of traffic on nearby roads
- Relocation and needy for compensation to affected parties

Biophysical impacts:

- Surface drainage and stormwater impacts including sedimentation and erosion (flow of surface draining systems might be disturbed)
- Impact on surface water resources
- Possibility of air pollution (dust during construction)
- Possibility of noise pollution
- Visually the site might be unpleasing
- Effect on natural and general ambiance of the area and surroundings/ impact on biodiversity
- Effect on vegetation (grass, shrubs and trees directly in areas to be cleared for construction of infrastructure)
- Impact on agricultural resources

- Effect on movement of animals
- Concerns if the area/ borrow pits can be restored / rehabilitated to an acceptable status once the construction phase is over.
- Impact of construction waste on the environment
- Storage of hazardous substances on site

Designed Impact Management Plan

It is anticipated that the existing alignment of the existing sandy track will be maintained as far as possible with only localised adjustments, if any, to comply with design standards. It is expected that property owners have to be compensated in areas where the horizontal alignment deviates from the existing alignment and at borrow pit sites.

The project team will follow the policy guidelines of the Communal Land Reform Act. Where applicable, owners in affected areas will have to be compensated for the effect of the widened road reserve. Property fences will be recorded during the GPS survey (preliminary design phase) to facilitate the determination of areas to be compensated. The consulting Engineers will subsequently be able to prepare compensation diagrams indicating the location and area for compensation. Seriously affected properties, especially where structures are involved, require special consideration and consultation with the project proponent (MWT).

The project proponent will then establish a compensation plan with landowners during the detailed design phase. The compensation negotiations and documentation will be finalised during the detailed design phase, and the Ministry of Works and Transport will settle payments before construction activities commence. This will create a cordial relationship between the proponent and the affected communities.

The Compensation Plan and Report will consist of the following elements:

- Compensation diagrams;
- Compensation calculations for payment;
- Signed compensation forms from landowners for payment by the Ministry of Works and Transport (and supporting documents, i.e., ID, etc.);
- Complete compensation file including all of the above.

The proposed project activities will impact will have a direct impact on bio diversity. The EAP recommends that all project activities stay away from identified water points most likely to be used by wildlife to avoid human – wildlife conflicts. More so project designs must by all means use of visible signage, permissible speed limits and awareness to control traffic movement. During the construction phase of the project, the proponent and appointed contractors should make sure incident reports, quarterly reports are updated and submitted to MEFT regularly.

3.2. ESMP Organisation, Responsibility and Authority

This section describes the key functionaries in the planning, implementation and monitoring of the ESMP. Copies of this ESMP shall be kept at the site office and will be distributed to all senior contract personnel appointed as contractors during the project development phase. All senior personnel shall be required to familiarise themselves with the contents of this document.

The implementation of this ESMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each project phase.

3.2.1. Site instruction entries

The Site Instruction Book entries will be used for the recording of general site instructions as they relate to the works on site and ESMP measures. It will also be used for the issuing of stop-work orders issued by the Environmental Control Officer (ECO) for the purposes of immediately highlight any particular activities of the Contractor in lieu of the environmental risk that they may pose.

3.2.2. ECO diary entries

The purpose of these entries will be to record the comments of the ECO as they relate to activities on the site including infringements, possible changes to the ESMP or work stop orders.

3.2.3. Method statements

Method statements from the Contractor will be required for specific sensitive actions on request of the authorities. A method statement forms the baseline information on which sensitive area works takes place and is thus considered a "live document" in that modifications can be negotiated between the Contractor and Environmental Control Officer if or as required. The Contractor (and, where relevant, any subcontractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the approved methodology. Changes in the methodology must be reflected by amendments to the original approved Method Statement. Amendments must be signed by both the ECO and Resident Engineer (RE), denoting that the change is environmentally acceptable. The Contractor must also sign the amended Method Statement.

All method statements will form part of the ESMP documentation and are subject to all terms and conditions contained within the ESMP main document. The Method Statement shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- How and where materials will be sourced and stored;
- The containment of accidental leaks or spills;
- Timing and location of activities; and
- Any other information deemed necessary by the ECO.

The Contractor must submit the method statement two weeks before any particular construction activity is due to start, especially with respect to impacts on sensitive ecosystems. Work may not commence until the method statement has been accepted by the ECO and RE, and clearly communicated to the workforce. The Contractor shall, except in the case of emergency activities, allow 14 days for consideration and approval of the Method Statement. The RE or EC may require changes to a Method Statement if the proposal does not comply with the specifications or if, in the reasonable opinion of the RE, the proposal may result in damage to the environment in excess of that permitted by the specifications. Approved Method Statements shall be communicated to all relevant personnel.

All Method Statements listed below, shall be provided by the Contractor before the activity commences:

(i) *Bunding*

Method of bunding for static plant and bulk fuel storage.

(ii) *Camp establishment and fencing*

- *Location and layout of the Contractor's Camp.*
- *Method of installing fences required for working areas and Contractor's Camp.*

(iii) *Concrete batching*

Location, layout and preparation of concrete batching facilities, including the methods employed for mixing of concrete including the management of runoff water from such areas.

(iv) *Bulk earthworks*

Location, layout, silt/sediment management and the management of runoff from bulk earthworks areas.

(v) *Demolition*

Proposed method of demolition, including handling and disposal of materials.

(vi) *Dust*

Dust control protocol.

(vii) *Fire and hazardous substances*

- *Handling and storage of hazardous wastes.*

- *Emergency spillage procedures and compounds to be used.*
- *Emergency procedures for accidental fire.*
- *Methods for the disposal of hazardous materials.*

(viii) *Fuels and fuel spills*

- *Methods of refuelling vehicles.*
- *Details of methods for fuel spills and clean-up operations.*

(ix) *Protection of archaeological resources*

Methods for dealing with archaeological resources in the event that any are found.

(x) *Protection of environmentally sensitive resources (fauna and flora)*

- *Methods for dealing with conservation areas or areas identified as environmentally sensitive requiring protection.*
- *Locality and preparation of onsite nursery to house vegetation relocated from construction areas or propagated locally for replanting purposes.*
- *Details of methods dealing with the identification, transportation and transplanting of flora species of conservation value.*
- *Details of methods dealing with the identification, capture and relocation of fauna species of conservation value.*

(xi) *Rehabilitation*

Rehabilitation of disturbed areas and borrow pits after construction is complete.

(xii) *Settlement ponds and sumps*

Layout and preparation of settlement ponds and sumps.

(xiii) *Solid waste management*

Solid waste control and removal of waste from Site.

(xiv) *Sources of materials*

Details of materials imported to the Site (where applicable).

(xv) *Topsoil handling and stockpiling*

Details on stripping, handling and stockpiling of topsoil.

(xvi) *Wash areas*

Location, layout, preparation and operation of all wash areas.

(xvii) *Storm water management*

Details of how storm water is to be handled on site.

3.3. Environmental Education and Awareness

Before any work is commenced on the Site, the entire Contractor's staff including foremen shall attend an environmental education talk, presented by the ECO with the assistance of the Contractor. The Contractor shall liaise with the ECO prior to the commencement date to fix a date and venue for the talk. The Contractor shall ensure that all the employees attend the talk.

Follow-up education talks shall be held for any new employee/s coming onto Site from time to time. The ECO shall ensure that all attendees sign an attendance register, and shall provide the ECO with a copy of the attendance register.

3.4. Record Keeping

All records related to the implementation of this management plan (e.g., site instruction book, ECO diary, induction records, method statements) must be kept together in an office where it is safe and can be retrieved easily. All relevant records should be kept for a minimum of two years after construction and should at any time be available for scrutiny by any relevant authority or stakeholder.

It is recommended that photographs (fixed-point photographs for better comparisons before/during/after) are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with related documents and other records related to this ESMP.

3.5. Environmental Completion Statement

An Environmental Completion Statement will be prepared by the ECO for submission to the Department of Environmental Affairs (Ministry of Environment and Tourism) indicating completion of the project and compliance with the EMP and conditions. This statement will be prepared after the final audit and after the rehabilitation phase. Rehabilitation phase will consist of identifying polluted areas, gully reclamation and made sure all used borrow pits are domesticated.

A borrow pit rehabilitation plan focuses on restoring a disturbed area, like a pit dug for construction materials, to a stable, environmentally sound state, often involving erosion control, slope stabilization, and revegetation.

3.5.1. Understanding the risks of borrow pits abandonment, Adopted from CSIAP and The World bank)

According to the World bank, small scale rural development projects such as rural road rehabilitation, small tank cascade restoration etc require significant quantities of earth and gravel. Often, this material is borrowed from the local environment with or without a valid clearance from the necessary authorities. Once the project is completed, these borrow pits are usually abandoned without proper closure, leaving open, water-filled, unattended pits that are associated with many risks.

Notable risk factors associated with abandoned borrow pits include:

(i) frequent sliding (especially in hilly areas),

(ii) loss of life and ecosystem services,

(iii) groundwater contamination,

(iv) increase in vector populations and associated illnesses and

(v) loss of arable land and flora and fauna.

The world bank therefore postulates the importance of identifying potential environmental risk factors posed by abandoned borrow pits to the local environment and people from project activities. As soon as sites for borrowing are identified, the most suitable form of site restoration need to be planned on order to close the pit/s properly.

OPTIONS AND RECOMMENDATIONS FOR REHABILITATION

The world bank in collaboration with CSIAP gives a guideline with options and recommendations on borrow pits rehabilitation. Many options have been identified for the rehabilitation of borrow pits around the world ranging from water retention ponds/lakes, borrow pit meadows, marshes to recreational areas. However, these require a more in-depth planning and designing of the borrow pits as well as technical interventions and after care and maintenance resulting in relatively high rehabilitation costs. These interventions are more likely in large scale development projects.

Applicability to the project: *The proposed project will make use of appointed consulting engineers to identify suitable borrow pits. The engineers will set a budget and costs of rehabilitation the borrow pits. Considering the proposed project scale, moderate environmental damage is likely to be encountered. There surveyed borrow pits should move away from identified wildlife pockets which are sensitive to seasonal migrating elephants' routes.*

The world bank published that when a project produced a large scale borrow pits, it can be turned into fish ponds, man-made lakes, reservoirs etc. Therefore, for relatively small-scale development projects it is recommended to rehabilitate the borrow area to resemble its original state to the extent possible. Where possible, options provided above can be incorporated.

Main steps to follow when identifying a borrow pit

1. Identify the borrow site/s for gravel and earth and obtain clearance from site engineer

2. At the start of borrowing, topsoil should be carefully removed and stored on the edges of the borrow area.

3. On completion of borrowing, the pit should be filled with spoil/soil/dredged matter followed by the reinstatement of the top soil that has been stored.

4. Filling of the pit should either achieve (a) original ground level or (b) new level as depicted in the diagram, agreed with the site engineer

5. This will be followed by compaction and in-situ and laboratory testing to achieve the original geotechnical ground condition

In addition to the topsoil that was removed from the pit surface, dredge material and other topsoil that is removed from the project site (close by) can also be used to fill the borrow pit.

Figure 4 overleaf provides a best practice diagram for progressive rehabilitation of a shallow borrow pit, that is done while the borrowing is ongoing. Once borrow material removal is completed from one area, the topsoil and any other fill material is reintroduced so that vegetation can start recolonizing. This will also reduce erosion issues and stabilizing pit embankment. If this method is adopted, it will also reduce the rehabilitation effort required at the end.

Figure 3 below shows rehabilitated borrow pits – some into recreational gardens and others into gently undulating landscapes.

Figure 4: Borrow pits filled and rehabilitated

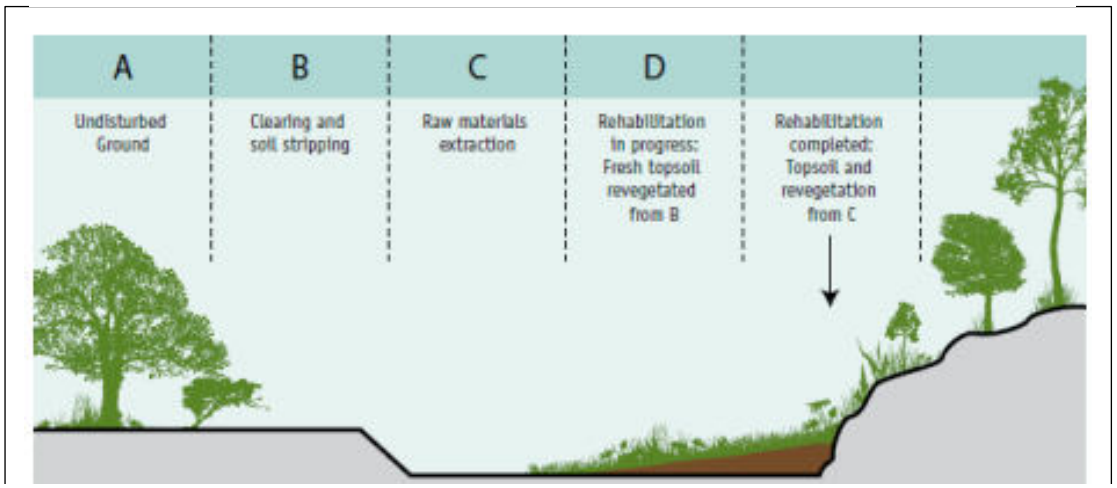

Figure 5: Progressive rehabilitation to maximize visual amenity. (Adopted from Code of Practice for Small Quarries, Department of Primary Industries, Australia 2010)

Attention should also be directed to the area surrounding the pit including the access paths of the machinery as the vegetation in these areas will also be disturbed. These areas should also be properly rehabilitated (by levelling and revegetating) so that it does not give rise to erosion issues and water stagnation.

Important points

- Borrow pits should be properly sited, planned and designed by professionals, with provision of appropriate safety measures. The location of the borrow pit has to be planned in consultation with the local authorities and the community.
- Operators, host community and the government agency must agree and enforce reclamation of borrow pits soon after use. Reclaiming a borrow pit should be as important as opening a borrow pit, towards sustainable engineering and environment.
- If new ponding/wetland area is created as a result of rehabilitation of the borrow site, this should be done in with technical advice from an engineering and environmental expert to ensure that this water body is in line with existing natural environment and does not lead to drainage issues, steep slopes leading to potential accidents, vector breeding sites and garbage dumping sites.

3.6. Roles And Responsibilities

3.6.1. Duties and Powers of the Environmental Consultant (EC)

The Environmental Consultant is ultimately responsible for:

- The environmental consultant will be responsible for the periodic monitoring and evaluation of ESMP implementation.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications via the RE.
- Auditing the implementation of the ESMP and its compliance on a monthly/quarterly basis.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document.

3.6.2. Duties and Powers of the Resident Engineer

The Resident Engineer is ultimately responsible for:

- The Resident Engineer (RE) of the Consulting Team will act with restricted powers and responsibilities as delegated by the Engineer in writing.

- For this project it is envisioned that the function of the Environmental Control Officer (ECO) will only require part time inputs. The RE may fulfil the function of the ECO thereby taking responsibility of the ECO's duties (see below) on this project.
- Any on-site decisions regarding environmental management are ultimately the responsibility of the RE with consultation with the environmental Consultant. Therefore, the RE must assign the role of ECO to a competent member of its site supervising team. The RE shall assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMP:
    - Ensuring that the necessary environmental authorisations and permits have been obtained by the Contractor.
    - Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
    - Ordering the removal of person(s) and/or equipment not complying with the EMP specifications.
    - Issuing fines for transgressions of site rules and penalties for contravention of the EMP.
- The management and continuous monitoring of the implementation of the ESMP on a daily basis will be the responsibility of the Resident Engineer.

3.6.3. Duties and Powers of the Environmental Control Officer

The Environmental Control Officer (ECO) will be a competent person determined by the RE to fulfil the role as the Employer's representative to monitor and review the on-site environmental management and implementation of this EMP by the Contractor.

The ECO's duties will include the following:

- Assisting the RE in ensuring that the necessary environmental authorisations and permits have been obtained.
- Maintaining open and direct lines of communication between the RE, Employer, Contractor, and interested and affected parties with regard to environmental matters.
- Facilitating all communication between the local community and the contractor.
- Regular site inspections of all construction areas with regard to compliance with the ESMP.
- Monitoring and verifying adherence to the ESMP by verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the ESMP via the RE.

3.6.4. Duties of the Contractor

The contractor shall be responsible for the implementation of the ESMP and the action plan, onsite monitoring and evaluation of the ESMP through the following;

On the on-set of the project, the contractor through an Environmental Officer shall:

- Develop a Hazard Identification and Risk Assessment report on the on-set of the project to be approved by the environmental Consultant.
- Developing a waste and contractors camp management plan to be approved by the environmental consultant
- Submit a monthly Environmental Performance report to the Environmental Consultant.

In addition, the Contractor shall furthermore ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the ESMP.

The presentation shall be conducted, as far as is possible, in the employees' language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the ESMP.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the specifics of this ESMP and its specification (no-go areas, etc.) and of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the ESMP.
- The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

The induction programme should be developed and submitted to the RE and environmental consultant for approval.

NB: The Contractor shall clearly describe the overall methodology proposed for the task specific related activities in particular method statements.

All method statements must take environmental requirements into account.

3.7. Financing Of Environmental Control

Financing of the environmental requirements as outlined in this document, apart from the appointment of specialists, is the sole responsibility of the Contractor appointed by the project proponent.

Therefore, it is accepted that the cost incurred for implementing this ESMP by the Contractor would be allocated for in the tender document. Any responsibilities not defined in this document or where any uncertainties arise in this matter will be the responsibility of the project proponent.

3.8. Amendments Of The ESMP

Any party involved with the project can suggest changes to the ESMP via the EC or RE. Such suggestions will be discussed with the Environmental Forum. Approved changes will be minute and drafted into the existing/ approved ESMP in the form of an appendix or amendments.

3.9. Procedures for non-compliance

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the RE to impose a penalty. This applies to the Environmental and Social Management Plan (ESMP).

In the event of non-compliance, the following recommended process shall be followed:

- The RE shall consult the environmental consultant and if agreed, issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the ECO.
- The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor shall provide the RE with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the ECO.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the RE shall impose a monetary penalty based on the conditions of contract.
- In the case of the Contractor being unable to remedy the situation due to permanent environmental damage already incurred, the RE shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the RE shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion etc, between any parties in regard to or arising out of interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP etc., any party shall be entitled to require that the issue be referred to independent specialists for determination.
- The RE shall at all times have the right to stop work and/or certain activities on site in the case of safety and ESMP non-compliance or failure to implement remediation measures.

3.10. Fines and Penalties

The following fines and penalties are in place for transgressions listed below. It will be issued after the procedure in Section 7.6 has been duly followed and only in severe cases and after repeated non-compliance. The graveness of the transgression is justified by each specific penalty.

FINES

Fines may be issued per incident at the discretion of the RE. Such fines will be issued in addition to any remedial costs incurred as a result of noncompliance with the EMP. The RE will inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from the Contract.

Fines for the activities detailed below, will be imposed by the RE on the Contractor and/or his Subcontractors.

Any persons, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a “no-go” area.	N$2,000
Any vehicle guilty of reckless driving on and in the vicinity of the site, including excessive speeds.	N$1,000
Any vehicle being driven and items of plant or materials being parked or stored outside the demarcated boundaries of the site.	N$2,000
Persons repeatedly walking outside the demarcated boundaries of the site.	N$1,000
Persistent and un-repaired spilling of hazardous materials and materials causing pollution.	N$3,000
Persistent littering on site.	N$500
Individuals repeatedly not making use of the designated toilet facilities.	N$200
Disposal of waste other than agreed on in the waste management plan.	N$5,000
Deliberate lighting of illegal fires on site (e.g. outside of the designated camp site).	N$2,000

For each subsequent similar offence, the fine may, at the discretion of the RE, be doubled in value.

The RE shall be the judge as to what constitutes a transgression in terms of this document.

PENALTIES

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.

The Contractor is deemed NOT to have complied with this specification if:

- within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the specification; environmental damage due to negligence;
- Safety of contractor personnel and public being compromised due to negligence;
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time;
- the Contractor fails to respond adequately to complaints from the public; and
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The RE will be responsible for a report on the non-repairable damage and / or non-compliance with visual and other evidence as well as issuing the penalty to the contractor with the report attached.

A copy must be handed to the ECO.

Table 4:The following penalties are suggested for transgressions:

Actions leading to erosion:	A penalty equivalent in value to the cost of rehabilitation plus 20%.
Oil spills:	A penalty equivalent in value to the cost of clean-up operation plus N$1,000.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of restoration plus N$2,000.
Damage to trees:	A penalty to a maximum of N$5,000 shall paid for each tree removed without prior permission, or a maximum of N$2,000 for damage to any tree, which is to be retained on site.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of restoration operation plus N$2,000.
Damage to sensitive environment:	A penalty equivalent in value to the cost of restoration operation plus 20%.
Damage to cultural sites:	A penalty to a maximum of N$100,000 shall be paid for any damage to any cultural historical site.
Damage to natural fauna:	A penalty to a maximum of N$2,000 for damages to any natural occurring animal.
Accident due to safety negligence:	A penalty to a maximum of N$50,000 for injuries to personnel or public.

4. CHAPTER FOUR: IMPACT MANAGEMENT PLAN

4.1. Project Design and Construction Phase

ENVIRONMENTAL AND SOCIAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
High unemployment rates.	• 'Outsiders' are often given the employment opportunities. • Loss of employment opportunities	During drafting of tender documents, the consultant shall include provisions designed to maximise the use of local labour. All unskilled labour shall be sourced from local communities and preference to be given to locals on semi -skilled and other skilled personnel. Specific recruitment procedures shall be spelled out.	Ensure that contractors that tender make provision for detailed recruitment plan in their tender application	Engineering Consultant, project proponent and the contractor will determine employment considerations.
	• Gender inequality.	At least 25% of recruits must be women.		
Health and social pathology.	• Increased sexual activities and associated social pathologies and health risks • Sex workers are usually hired from the local communities by the construction team.	• Prior to commencing construction, the risk of an increase in the spread of HIV/AIDS should be explained to regional health authorities and partners be identified amongst all stakeholders to formulate a joint programme to limit the spread of HIV during the construction period. • Particular provisions shall be worked into the tender documents for the contractor to approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS education programmes periodically on site.	Ensure that contractors that tender make provision for the co-opting of an HIV/AIDS health officer from the regional health office in their tender application	Consulting engineer in partnership with National and Regional HIV task forces and NGO's working in the field
	• Health and safety risks to the workers and public due to uncontrolled access to the public during construction • Unsafe traffic conditions	Prior to construction all construction workers should undergo environmental, safety and Health induction.	Ensure that contractors that tender make provision for environmental, safety and health induction in their tender applications	Contractor, Environmental Consultant will ensure a stipulated ESMP to be made available and clearly address Safety and Health issues. Contractor and the ECO will determine the implementation of safety,

ENVIRONMENTAL AND SOCIAL IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	• The lack of personal protective clothing, etc.			Health and the environmental impacts are minimised at all costs
Hazardous road conditions	• Obstacles in road as a result of construction activity. • Changes in design speeds • Road detours	Design an information campaign to sensitise the general community with regard to the increased design speeds along the road and general road works.	Ensure that contractors that tender make provision for an information campaign in their tender application	Consulting Engineers Environmental Consultant through ESMP drafting Contractor and Environmental Control Officer (ECO) / SHE representative during construction
Conflict	• Nuisances caused by the building contractor • Lack of communication between contractor and community	• A meeting should be arranged with the local community once the contractor has been appointed. • The contractor shall appoint an ECO/ SHE representative from the construction team to take responsibility for the implementation of all provisions of this EMP.	Ensure that contractors that tender make provision for the appointment of an ECO in their tender application Arrange a meeting once contractor has been appointed	Consulting Engineers (CE), Environmental Consultant (EC) through ESMP drafting, Environmental control Officer (ECO) during construction
Cultural decay	• The existing culture is likely to be affected by the incoming of people from different cultural groups	• The contractor must make sure that he hires locals on non-skilled jobs, and all skilled personnel from other cultural background must attend inception/ ground breaking meeting with the traditional leaders	Ensure that all skilled personnel from outside Musese constituency are well- versed with the local norms, beliefs and culture	Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Conflict.	• Communities dissatisfied with the activities • Nuisances caused by the building contractor	• Clear communication between contractor and community and farmers, on the schedule/timeframe for operations and the duration of the construction phase. This should be provided for in the form of a Public Consultation Plan (PCP) which should include at least: o One meeting for site-handover and to introduce the local community and farmers to the Contractor o A system for the on-going management of the communication between the Contractor and local community and farmers, which should include: ▪ A means for lodging a complaint concerning construction activity ▪ Provision of feedback to the plaintiff from the Contractor stating how the issue is being addressed ▪ Report back on issues raised and how addressed from the Contractor to the RE and client • RE and contractor should present detailed construction programme during a meeting with the local community and farm owners.	• Minutes of meetings • Draw up PCP	RE, ECO/ SHEQ Officer and Contractor
		• Ensure that relevant stakeholders are adequately informed throughout construction and that there is effective communication with and feedback to the RE and client.	Meetings and communication.	RE, EC and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• The contractor shall appoint a person from the construction team to take responsibility for the implementation of all provisions of this EMP.		
	Delayed construction, which has cost implications and causes low user satisfaction.	Programme delays into the schedule and communicate this to the community.	• RE and Contractor to constantly monitor delays and adapt programme accordingly. • Constantly update communities on delays and latest schedules.	RE and Contractor.
	Poaching and trapping	No poaching or trapping will be allowed and is a criminal offence.	RE, EC and Contractor to monitor	Contractor.
Dangerous work area	Existence of dangerous/hazardous work areas	• The work areas must be set out and isolated and demarcated by means of danger tape on a daily basis. The demarcated work area may only contain materials, equipment, and personnel required to execute the work. • Once the work for the day is completed, the demarcated area must be cleaned of any spilled materials and waste products. This must be disposed of in the allocated containers.	• Inspections for approval. • Record excavation/back fill schedule in the site instruction records.	RE and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• If the work area is dangerous or sensitive, the danger tape should stay in place until work is complete or not sensitive anymore.		
Threats to the health and safety of construction workers.	• Insufficient provision of safety equipment • Negligent behaviour	• The contractor must adhere to the regulations pertaining to health and safety, including the provision of protective clothing, failing which the contract may be suspended with immediate effect. • Failure to remedy such lack of provision may result in the immediate cancellation of the contract according to the clauses stipulated in the Specific and General Conditions of Contract. • The contractor should comply with all relevant labour laws as stipulated by the Labour Act. • First aid kits to be readily available in case of injuries	Regular visual inspection and records kept of safety equipment and materials issued.	ECO/ SHEQ officer/ rep, RE and Contractor.
		Dust protection masks shall be provided to staff members if they complain about dust.	Regular inspections and attendance to work complains.	RE, ECO/SHEQ rep/ officer and Contractor.
		Workers in the vicinity of sources of high noise should wear necessary protection gear.	Regular Inspection	RE, ECO/SHEQ representative/ officer and Contractor.
		NO person is allowed to smoke close to fuel storage facilities and in portable toilets at the construction site since the chemicals used in chemical toilets are highly flammable.	Regular Inspection.	RE, ECO/ SHEQ representative/ Officer and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		Workers should not be allowed to make use of the existing neighbourhood facilities. Potable water must be provided to workers to avoid dehydration.	Regular Inspection.	RE, ECO/ SHEQ representative and Contractor.
		Portable toilets should be available at the construction site in the following ratio: 2 toilets for every 50 females and one toilet for every 50 males.	Regular Inspection.	RE, ECO/ SHEQ rep or officer and Contractor.
	Low productivity and increase health risk of workforce due to high temperatures.	• Provide hats, ample drinking water • Provide regular breaks.	Daily checking of weather forecast.	RE, ECO/ ECO/ SHEQ rep or officer and Contractor.
	Fire incident.	• Foam fire extinguishers must be in close proximity to fuel kept on site • There should be trained personnel to handle this equipment • At least two extinguishers should be placed in the workshop.	Foam fire extinguisher should be available when work commences.	RE, ECO/ SHEQ rep or officer and Contractor.
	• Health and safety risks to the workers and public due to uncontrolled access to the public during construction • Unsafe traffic conditions, the lack of personal protective clothing, etc.	Specify health and safety risk avoidance measures.	Daily monitoring by contractor	Contractor/ ECO/ SHEQ representative

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Alcohol abuse.	Use of alcohol on construction site.	At no stage may a construction worker be allowed on site under the influence of alcohol.	• Daily monitoring by contractor. • Spot checks.	SHEQ rep/ ECO, RE and Contractor
Lack of privacy.	Intrude on neighbouring properties.	Under no circumstance are workers allowed to intrude on neighbouring properties.	Regular monitoring by RE.	RE and Contractor
CONSTRUCTION AREA				
Disorderly and unwanted settlement in the road reserve	Informal market stalls providing services to construction workers	• In consultation with the regional council and traditional authorities, to determine the conditions for of market stalls next to the road and at lay-byes. • No settlement will be allowed.	Set conditions for market stalls Regular inspection of site	Contractor
Construction site	Visual nuisance of the construction activities.	• The boundaries of the construction area shall be demarcated prior to any work commencing on the site • The construction area should be clearly marked.	RE and Contractor should agree on demarcation lines.	RE, ECO and Contractor.
	Improper conduct on construction site.	• The construction area should adhere to the following requirements: • Access should be controlled and only workers allowed within the boundaries of the campsite: o Records should be kept and all visitors should sign in and sign out of a visitor's logbook • The contractor should in no way permit or allow prostitution to take place at the construction area.	Regular visual and record inspection by the RE.	RE, ECO and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Campsite Establishment				
Negative impact on the social and ecological environment.	Establishment of campsite.	• One campsite should be established for all construction activity • The contractor must negotiate the use of existing facilities before considering entering new terrain. • The contractor must receive approval to use a facility or land in writing. This approval must state the remuneration and conditions of use. • Devise a layout for the site so that internal circulation of workers and vehicles in relation to the various construction functions is optimised.	Contractor and RE should agree on a satisfactory area.	Contractor with approval of the Proponent, EC and RE
	Conduct on campsite.	• No one is allowed to reside on the campsite, save for construction personnel. • The campsite may act as a facility for the storage of construction material, temporary stockpile sites, and fuel installations etc, required by the Contractor or subcontractors and suppliers. • Materials must be stored in a separate closed-off premise that is sufficiently prepared to protect the environment for pollution, such as impermeable floors, closed containers and a security fence.	Daily monitoring by contractor.	Contractor, RE
	Stockpiling materials on site.	• Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site.	• Daily monitoring by contractor. • Regular visual and records	RE and Contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills.	inspection by the RE.	
		• Stockpiles must be of a safe height of less than 2m high and 45° slope angle. Cement stacks must not be higher than 1.5m. • Protect all fluids containers from low temperatures to avoid leaks and pollution.	Regular visual and records inspection by the RE and appointed ECO/ SHEQ representative	SHEQ REP, RE and Contractor.
BIOPHYSICAL ENVIRONMENT				
Drainage issues.	Surface run-off.	Surface protection work is recommended on the river bed.	Daily inspection of the surface protection work.	EC, Contractor.
Soil pollution	Garbage, cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material.	• Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils (see waste management heading). • In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste.	Daily monitoring and regular visual inspection by contractor.	SHEQ rep/ ECO, RE Contractor
	Soil pollution by fuel leaks	If fuel is stored at the construction camp, fuel tanks must be properly bunded. The volume of the bunded area must be sufficient to hold 1.5 times the capacity of the storage tanks. The floor of the bunded	Daily monitoring by Contractor and regular visual inspection by RE	SHEQ rep/ ECO, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		area must be impermeable and the sides high enough to achieve the 1.5 times holding capacity.		
		Drip trays should be available for all equipment that is intended to be used during construction. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned every morning and the spillage handled as hazardous waste.	Daily monitoring and regular visual inspection by contractor.	SHEQ rep/ ECO, Contractor
	Soil pollution by cement mixed on the ground.	Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose.	Daily monitoring by Contractor and regular visual inspection by RE	RE, Contractor
	Cleaning of equipment.	All cleaning of equipment should take place within the construction site and the water from washing operation should be collected in a tank and disposed of in agreed manner.	Daily monitoring by Contractor.	RE, Contractor
	Heavy vehicles/ movement of vehicles across site.	The movement of vehicles to and across the site should be controlled. Construction material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil.	Daily visual inspection and monitoring by Contractor.	Contractor
BORROWPIT SITES	Sand mining/ road material mining	• The contractor in consultation with the environmental consultant and/or RE shall visit all potential excavation sites prior to excavation. The engineers and surveyors must then draft a plan for approval before commencement of excavations. This plan must indicate the required resources and sensitive areas that may not be mined (indication of the mature trees). • No removal of trees with a stem diameter of 200mm or more. Protect clusters of trees and individual trees with a space buffer of at least 5m.	Contractor and environmental consultant to visit all potential excavation sites.	EC through ESMP design, RE, Contractor

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• The top 150mm of topsoil must be stored separately for use to rehabilitate the borrow pit. • The removal of material at excavation sites shall be focused where the least significant vegetation exists. • The contractor shall liaise with the applicable local authorities regarding the location of excavation sites, leveraging existing data, geological analysis, and local knowledge will ensure a comprehensive and efficient identification of suitable material sources for the project • No borrow pit may be excavated from any sensitive or open space areas.		
WATER CONSERVATION				
Irresponsible use of water.	Water wastage due to careless practices during construction.	• Establish a water plan which, should include at least the following: o A description of: ▪ The source of the water ▪ Where and how the water will be stored ▪ How the water will be distributed/utilised o Describe measures that will be taken to conserve water at each of the above-mentioned phases • Educate the work force on sustainable and effective use of water, e.g. clean equipment in containers.	Daily inspections and condition reports.	RE, ECO and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
		• No member of the construction team is allowed to wash clothes OR vehicles on the construction site.		
	Leaks from tanks and taps.	Water should be used sparingly throughout the construction of the development. It is the responsibility of the site coordinator to ensure that water conservation is strictly enforced.	Daily inspections and condition reports.	RE, ECO and contractor.
		Water tanks / taps must be fixed. The water tank or taps must have water meters and be accessible to visual inspection. All faulty and leaking taps and pipes shall be immediately repaired.	Daily inspections and condition reports.	RE, ECO and contractor.
Groundwater contamination.	Refuse, garbage, cement, concrete, chemicals, fuels, oils or any other objectionable or undesirable material.	• Accidental spills must be cleaned immediately to avoid the pollution of the wetland, and ground water, since the soil around the site is highly permeable. • No member of the construction team is allowed to wash clothes OR vehicles on the construction site.	Inspection daily, reporting, and regular clean up.	RE, ECO and contractor.
CONSERVATION OF VEGETATION				
Loss of biodiversity	Clearing of vegetation (removal of trees etc).	• The area to be constructed on the site, as well as lay-down areas, access routes, etc should be clearly demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or removal of vegetation without the required authorisation is strictly prohibited. • All protected tree species will be tagged so that they are visible during construction works.	Regular review of photographic records. Take photographs before construction starts as a record. Monitoring by the EC	RE, ECO and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
	Planting of alien vegetation.	• No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason. • At the end of construction all alien vegetation that has established should be eradicated.	Regular inspection of site vegetation by the EC.	RE, ECO and contractor.
Impact on fauna	The proposed road is likely to interfere with a wildlife pocket associated with seasonal elephant movement. • Hunting	• The contractor and the entire construction team to be familiarised with the dos and don'ts within their area of operation from local authorities. The contractor to liaise with the Conservancy management and get relevant information about trophy hunting dates and time. • Hunting in any way is considered illegal	Regular inspections and compliance monitoring through bi annual reporting as well as post-construction reporting	RE, ECO, Contractor
WASTE MANAGEMENT:				
Construction waste.	Incorrect or infrequent disposal of building rubble.	Construction waste should be stored in skips and should regularly be removed off the site for disposal at an applicable municipal waste disposal site.	Regular inspection on site.	RE, ECO/ SHEQ rep and contractor.
	Construction waste blown by wind (e.g., cement bags).	Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste.	Daily inspection and clean up.	RE, EC and contractor.
Increased general waste.	Domestic waste from construction team.	• Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. • The various waste types shall be disposed of at appropriate municipal and recycling facilities. • Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. • Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility.	Daily inspection and clean up.	RE, ECO/ SHEQ rep and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Domestic waste.	Domestic waste from construction team.	• The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the construction site and not at the campsite. • Sufficient waste bins should be supplied.	Daily inspection and clean up.	RE, ECO/ SHEQ rep and contractor.
		Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week.	Regular inspection.	RE, ECO/ SHEQ rep and contractor.
Hazardous waste.	Accidental / negligent spillages from equipment working on site.	• Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. • Contact Wesco Group to salvage the spilled materials (see Appendix A for the contact details).	Daily inspection and clean up.	RE, ECO/ SHEQ rep and contractor.
	Storage of hazardous materials.	Bitumen products waste, oil sludge, oily rags, contaminated spill clean-up materials, contaminated soils and other hazardous materials waste must be kept off-site or in a dedicated separate container on site. These containers must be locked and only accessible by the site foreman. Wesco Group should be approached to collect these wastes periodically or as needed.	Daily inspection and clean up.	RE, ECO/ SHEQ rep and contractor.

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Ablution waste.	Construction team.	• Only portable chemical toilets will be used on site and at the campsite. Under no circumstances may the waste from these toilets be dumped in the veld. The waste should be removed at least once a week to the nearest municipal sewage site. Alternatively, it may be pumped out into sealable containers and stored until it can be removed by truck. If stored, the containers should be kept out of direct sunlight and should not be stored for longer than a month. People responsible for cleaning these toilets should be provided with latex gloves and masks. • Spillage or leakage to be cleaned-up and fixed immediately.	Daily inspections and clean-up.	RE, ECO/ SHEQ rep and contractor.
DUST CONTROL:				
Dust generation.	Dust proliferation due to fines content of soil.	• Soil stacks should be placed downwind from the main activity areas and from the road detour. • All construction areas and soil stacks should be regularly wetted.	Visual monitoring for dust nuisance and safety	RE, ECO/ SHEQ rep and contractor.
NOISE CONTROL:				
Noise generation.	Noise from vehicles and construction activities.	• All machinery should be calibrated and maintained regularly. • Construction activities should be discontinued during night-time hours (18h00 to 07h00) and over week-ends.	• Daily monitoring. • Complaints from neighbours. • Records of how these have been addressed.	RE, ECO/ SHEQ rep and contractor.

4.2. Post-Construction Phase

ENVIRONMENTAL MANAGEMENT IMPACTS REQUIRING MITIGATION	SOURCES OF IMPACTS	MITIGATION MEASURES	MONITORING ACTIONS AND METHODS	RESPONSIBILITY FOR IMPLEMENTATION
Hazardous unattended construction site	Temporary structures, equipment, materials, waste and facilities used for construction activities.	Clear and clean the construction site to the satisfaction of the RE.	Inspection of the site by the RE	RE, ECO, Contractor
Unsightly borrow areas	• Unstable slopes of unrehabilitated borrow pit. • Loose sediment washed away from unstable slopes.	Shape all sides of the borrow pit to 30° to horizontal. Rip the terrain and access routes and replace the stored topsoil evenly over the terrain.	Inspection by RE, EC after rehabilitation.	EC, Contractor, ECO and Engineer.

5. CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

Arising from the analysis by the consultants, the proposed road construction activities bring negative and positive impacts to the proposed project site and nearby environs. Therefore, the project proponent and the Project Manager should effectively implement the contents of this ESMP and consult the Environment Consultant regularly for sustainable project implementation.

5.2. Recommendations

In order to alleviate any negative impacts that may emanate from the road project, the contractor and the proponent (Ministry of works and transport) should follow recommendations as follows:

5.2.1. Environmental Management Plan Recommendations

In order to ensure a healthy and safe environment in the proposed site and its environs, a plan for environmental management has to be instituted through monitoring. This involves the collection and analysis of relevant environmental data as well as periodic documentation and reporting.

The proposed project area falls within an Environmental protected area hence the biodiversity report should guide the project proponent, designing Engineers, appointed contractor as well as the Project Manager, Resident Engineer and the Environmental Control officer or Safety Health and Environmental Quality representative. This will address all anticipated bio diversity concerns associated with the project implementation and ensure a sustainable project.

No borrow pit may be excavated from any sensitive or open space areas. The Environmental consultant strongly recommends that the designing engineer should consider re sitting of the surveyed borrow pits which falls in a wildlife exclusive zone.

5.3. External Auditing

The key to a successful ESMP is appropriate monitoring and review to ensure effective functioning of the ESMP and to identify and implement corrective measures in a timely manner. In the event that discrepancies are identified, the problem must be investigated and attended to. All the results obtained during environmental monitoring must be documented for audit purposes.

An audit of the environmental management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards. Audits should be conducted during the construction and post construction phase of the facility to ensure adherence to the management measures contained in the ESMP. All burrow pits used should undergo a documented rehabilitation programme by the

contractor and the project proponent. Post construction Audit to be done by appointed Environmental Consultant and submit Bi annual reports to relevant authorities.

5.4. Recommendation to MEFT

Having looked at the potential impacts of the proposed project development, the risks associated with the development and the mitigation measures contained in this ESMP, EnviroPlan Consulting cc hereby recommends that the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs (MEFT:DEA) approve the proposed planning, design and upgrade of the proposed access road and issue an Environmental Clearance Certificate (ECC) on condition that the proponent will ensure complete compliance to the developed Environmental and Management Plan (EMP) and as per recommendations in the bio diversity report attached as Appendix (ii) of the Environmental scoping report.