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TOWN, REGIONAL PLANNERS AND ENVIROMENTAL CONSULTANTS

ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION OF DR3469 MBEYO-ERAGO (20.5 KM) GRAVEL ROAD IN KAVANGO WEST REGION, NAMIBIA

REGISTRATION NO: APP-006883

PREPARED BY:	**PROJECT PROPONENT:**
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EXECUTIVE SUMMARY

Note: The initial submission referenced the Mbeyo–Erago road length as 18.3 km. The correct length is 20.5 km, which is used throughout this EMP.

This Environmental Management Plan (EMP) has been prepared for the proposed upgrading and construction of the DR3469 Mbeyo–Erago Gravel Access, extending approximately 20.5 kilometers within the Kavango West Region of Namibia. The existing alignment is currently a deep sand track accessible only by 4x4 vehicles, characterized by poor drainage, rutting, and seasonal inaccessibility. These conditions have long constrained mobility, service delivery, and economic activities for surrounding communities, making the upgrade a critical intervention for regional development.

The EMP provides a framework for identifying, mitigating, and monitoring potential biophysical and socio-economic impacts associated with the project. It ensures compliance with Namibia's Environmental Management Act (No. 7 of 2007) and EIA Regulations (2012), while aligning with Roads Authority manuals and best practice standards. Institutional roles and responsibilities are clearly defined, ensuring accountability by the Roads Authority, Resident Engineer, Contractors, Environmental Consultants, and Environmental Compliance Officers.

Anticipated benefits include:

- Year-round access to schools, clinics, agricultural fields, and dispersed homesteads.
- Improved mobility for vulnerable populations and enhanced emergency response capacity.
- Facilitation of agricultural produce transport to local and national markets.
- Reduced travel times, lower vehicle operating costs, and stimulation of small-scale trade.
- Employment opportunities for local residents during construction and operation phases.
- Strengthened regional integration by linking rural communities to the B8 national road.

Potential negative impacts include: Vegetation clearance, soil erosion, dust emissions, noise, waste mismanagement, safety hazards such as unexploded ordinance (UXO), and minor habitat disturbance. These impacts are considered manageable through strict adherence to the EMP, which prescribes site-specific mitigation measures such as erosion control, dust suppression, borrow pit rehabilitation, and waste management. Compliance monitoring by Environmental Compliance Officers, coupled with community engagement and transparent reporting mechanisms, will ensure that environmental and social safeguards are upheld throughout the project.

The assessment finds that the proposed DR3469 Mbeyo–Erago Gravel Access upgrade is environmentally and socially acceptable, provided that mitigation measures outlined in the EMP are fully implemented. The project is expected to serve as a catalyst for socio-economic growth in Kavango

West, while safeguarding ecological integrity and community well-being. Approval is therefore recommended, subject to compliance with the EMP and relevant legislation.

Table of Contents

Abbreviation	Full Meaning
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ECC	Environmental Clearance Certificate
RA	Roads Authority
RE	Resident Engineer
MEFT	Ministry of Environment, Forestry and Tourism
ECO	Environmental Compliance Officer
EAP	Environmental Assessment Practitioner
HSE	Health, Safety and Environment
I&APs	Interested and Affected Parties
BID	Background Information Document
UXO	Unexploded Ordnance
MWT	Ministry of Works and Transport
RKPC	Ritta Khiba Planning Consultants
BP	Borrow Pit
PPE	Personal Protective Equipment
NGO	Non-Governmental Organization
B8	National Trunk Road B8 (Namibia)

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

It is hereby acknowledged that the initial submission to the EIA portal referenced the Mbeyo–Erago road length as 18.3 km. This was an inadvertent error. The correct road length is 20.5 km. All assessments, impact evaluations, and mitigation measures presented in this Environmental Management Plan and Environmental Impact Assessment (EIA) are based on the accurate figure of 20.5 km.

1.1 Background

The Ministry of Works and Transport (MWT), in collaboration with the Roads Authority (RA) and Trinitas Consulting Engineers, is undertaking the upgrading and construction of the DR3469 Mbeyo–Erago Gravel Access in the Kavango West Region of Namibia. Ritta Khiba Planning Consultants (RKPC) have been appointed as the Environmental Assessment Practitioners to prepare the Environmental Management Plan (EMP) in compliance with the Environmental Management Act (No. 7 of 2007) and EIA Regulations (2012).

The existing alignment is a deep sand track accessible only by 4x4 vehicles, characterized by poor drainage, rutting, and seasonal inaccessibility. This has long constrained mobility, service delivery, and economic activities for surrounding communities. The proposed upgrade to gravel standards will extend approximately 20.5 kilometers, linking Mbeyo settlement to Erago village and associated institutions such as Erago Primary School and Erago Clinic.

The project is recognized as a regional priority due to its strategic socio-economic value. It will directly benefit learners, teachers, healthcare workers, and dispersed rural households, while also facilitating agricultural transport and regional integration by connecting to the B8 national road.

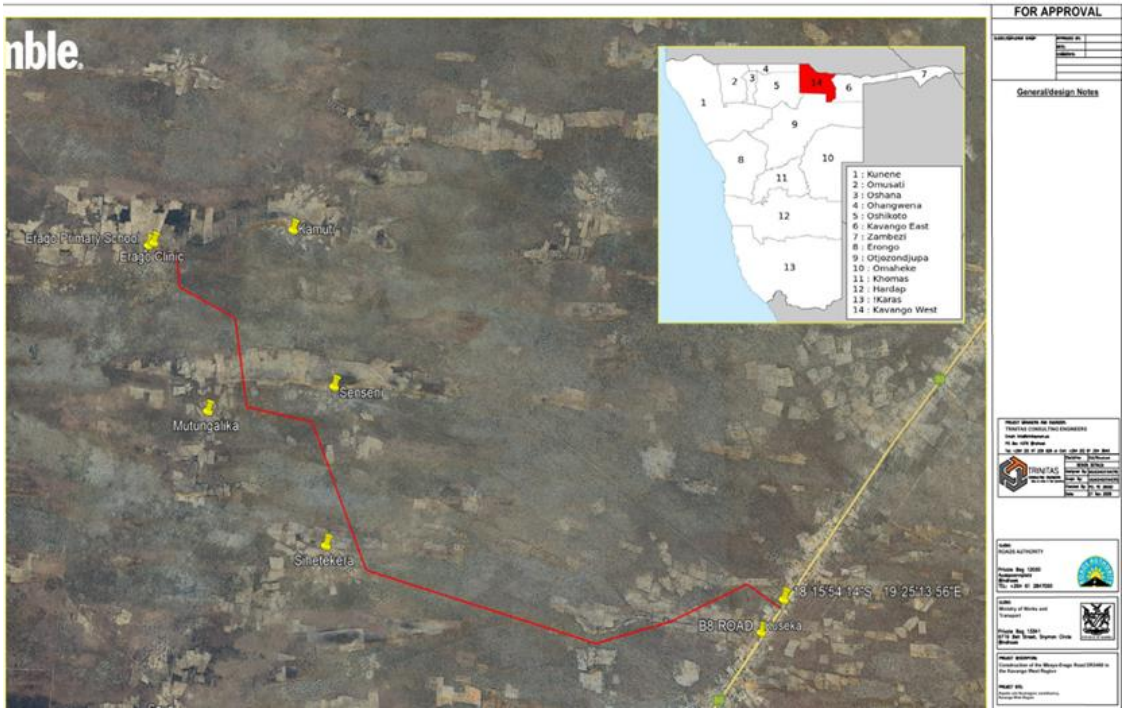

Figure 1: DR3469 Road, Nkurenkuru, Kavango West Region

1.2 Objectives and Scope

The primary objective of this EMP is to ensure that the proposed construction of the DR3469 Mbeyo–Erago Gravel Access is planned and implemented in an environmentally responsible, socially inclusive, and legally compliant manner.

Specific objectives include:

- Legal Compliance: Fulfil requirements of Namibia's environmental legislation by securing an Environmental Clearance Certificate (ECC).
- Environmental and Social Screening: Identify and assess potential impacts associated with the alignment, construction activities, and long-term use.
- Stakeholder Engagement: Facilitate meaningful consultation with Interested and Affected Parties (I&APs), including local communities, traditional authorities, and regional councils.
- Sensitivity Mapping and Site Suitability: Evaluate terrain, soil conditions, vegetation, wildlife, and land use patterns to minimize disruption.
- Development of a Site-Specific EMP: Outline mitigation measures, monitoring requirements, and roles/responsibilities during construction and operation.
- Support for Strategic Planning: Provide evidence-based recommendations that align with regional development priorities and future infrastructure planning.

1.3 Components of the EMP

The EMP identifies potential environmental and social impacts associated with the proposed development and prescribes mitigation measures to ensure compliance with the Environmental Management Act and Roads Authority standards. It will form part of the project tender and contract, with clauses incorporated into construction specifications.

The EMP comprises:

- Environmental aspects to be managed.
- Management objectives for each aspect.
- Mitigation measures and actions required.
- Monitoring indicators to track compliance.
- Roles and responsibilities of key stakeholders.

1.4 Flexibility of the EMP

The EMP is an open-ended document subject to review and updating. During implementation, unforeseen issues may arise, requiring adjustments to mitigation measures. Flexibility ensures that:

- New information can be incorporated.
- Additional activities or impacts can be addressed.
- Industry best practices can be adopted.

Any changes or inclusions made during construction operations, through internal monitoring and auditing by Environmental Compliance Officers, will be binding on the proponent and contractors.

1.5 Implementation Framework and Accountability

For effective implementation, institutional roles are clearly defined. The Roads Authority, Resident Engineer, Contractors, Environmental Consultants, and Environmental Compliance Officers each have specific responsibilities for compliance, monitoring, and reporting. Interested and Affected Parties (I&APs) and local communities also play a role in reporting concerns and ensuring accountability.

2. PROJECT INFORMATION

2.1 Project Location and Route Description

The proposed project is situated in the Ncamangoro Constituency of the Kavango West Region, Namibia, along the DR3469 alignment connecting Mbeyo settlement to Erago village. The route extends approximately 20.5 km in length, traversing flat to gently undulating terrain typical of the Kalahari Basin. The soils are sandy and prone to seasonal flooding, rutting, and erosion, which have historically constrained mobility and service delivery for surrounding communities.

Key location details:

Figure 2: Mbeyo-Erago Road

- **Start Point:** Junction with B8 (T0804) at Mbeyo settlement.
- **End Point:** Erago Primary School and Erago Clinic.
- **Region:** Kavango West.
- **Constituency:** Ncamangoro
- **Terrain:** Flat to gently undulating, sandy soils prone to seasonal flooding.
- **Surroundings:** Scattered homesteads, bushland, subsistence farming, and community institutions.
- **Latitude -**18.2709° (18° 16′ 15″ South) and **longitude** 19.41503° (19° 24′ 54″ West).

The alignment follows an existing traditional track used by vehicles, livestock herders, and community members, thereby minimising new land clearance and reducing potential environmental disturbance.

Sensitive receptors along the corridor include Erago Primary School, Erago Clinic, and households located within 50–100 m of the road.

The project corridor passes through dispersed rural homesteads, communal grazing areas, and subsistence agricultural fields. Its strategic importance lies in linking rural communities to the B8 national trunk road, thereby enhancing regional integration, access to essential services, and economic opportunities.

Figure 3: Current conditions of DR3469 Road, Kavango West

2.2 Envisioned Road Works

The upgrading and construction of the DR3469 Mbeyo–Erago Gravel Access will involve several key stages:

Table 1:Envisioned road works

Stage	Key Activities
Clearing & Grubbing	Vegetation removal, topsoil stripping, disposal of unsuitable material
Earthworks	Cut-to-spoil, cut-to-fill, borrow pit sourcing, subgrade shaping
Drainage Works	Side drains, mitre drains, catchpits, culverts with headwalls/wingwalls
Roadbed Preparation	Trimming, moisture conditioning, compaction testing
Layer Works	Gravel placement (150–200 mm), watering, compaction, grading
Wearing Course	High-quality gravel surfacing, shaping, compaction
Structures & Ancillary Works	Culverts, drifts, signage, markings, kilometre posts
Finishing Works	Road edge shaping, drainage finishing, site cleaning

2.3 Borrow Pits

Three borrow pits have been identified and prospected for construction material:

Table 2: Construction material borrow pits

Borrow Pit	Coordinates	Service Section (km)	Chainage	Material Class	Estimated Quantity (m^3)
BP01	18° 15.994'S, 19° 23.617'E	0–5	3+000	G6/5	34,932
BP02	18° 16.100'S, 19° 20.360'E	5–15	9+000	G5	58,473
BP03	18° 11.626'S, 19° 16.288'E	15–20	20+500	G6	51,015

A fourth borrow pit may be required during construction to meet material demands. Rehabilitation measures will be implemented for all borrow pits to restore environmental integrity post-construction.

2.4 Water Resources and Borehole Protection

Construction water will be sourced from new boreholes drilled specifically for the project, supplemented where feasible by open pits, surface water bodies, or piped infrastructure. Once operational, these boreholes will be handed over to local communities to strengthen long-term water access. To ensure sustainability and protect community use, the following measures will be implemented:

- Abstraction permits obtained in line with the Water Resources Management Act (2013).
- Boreholes fenced or otherwise protected during construction.
- Bunded storage for fuel and oils near borehole sites.
- Spill kits provided and staff trained in spill response.
- Weekly monitoring of borehole use and protection status, with records maintained by the Contractor and verified by the ECO.

2.5 Accommodation of Traffic

Table 3: Traffic

Measure	Description
Temporary Signage	Erected to warn road users of construction activities
Traffic Control	Implemented to ensure safe passage during works
Compliance	All measures in line with Roads Authority specifications

2.6 Field Investigations

Site visits and geotechnical investigations have been conducted to identify suitable construction materials. Community consultations provided guidance on areas traditionally used for earth dams and wells, which often contain gravel material.

Figure 4: Soil conditions on site

Figure 5:Proposed route vegetation observed

2.7 Safety and Security – Potential Explosives Risk

Table 4:Potential explosives risks

Risk	**Mitigation Measure**
Potential presence of unexploded ordnance (UXO) due to historic military use	Formal clearance by competent authorities before excavation, grading, or drilling
Worker & Community Safety	No works commence until clearance certificate issued
Emergency Protocol	Immediate halt and notification if UXO suspected during construction

3. LEGISLATIVE FRAMEWORK

The upgrading and construction of the DR3469 Mbeyo–Erago Gravel Access is a listed activity under Namibia's Environmental Management Act (No. 7 of 2007) and the EIA Regulations (2012). As such, an Environmental Clearance Certificate (ECC) must be obtained prior to implementation. The EMP has been developed to ensure compliance with all relevant legislation, policies, and guidelines.

3.1 Core Legal Instruments

Table 5:Legal Frameworks

Legislation / Policy	Key Provision	Relevance to Project
Namibian Constitution (1990)	Mandates sustainable management of ecosystems and biodiversity for present and future generations	Provides overarching environmental protection principles
Environmental Management Act (No. 7 of 2007)	Requires environmental assessments for listed activities; promotes sustainable resource use	Legal basis for EIA and EMP; ECC required before project implementation
Environmental Assessment Policy (1995)	Ensures environmental consequences are considered in planning	Guides integration of biophysical, social, and economic impacts
EIA Regulations (2012)	Sets procedures for scoping, consultation, reporting, and submission	Governs preparation and approval of this EMP

3.2 Sectoral Legislation

Legislation	Key Provision	Relevance to Project
Water Resources Management Act (No. 11 of 2013)	Protects water resources; requires permits for abstraction/discharge	Ensures sustainable water use and borehole protection
Public Health Act (No. 36 of 1919)	Provides for sanitation, food safety, and disease control	Relevant for dust, noise, and waste management
Labour Act (No. 11 of 2007)	Establishes labour rights and workplace safety standards	Ensures fair recruitment and safe working conditions

Nature Conservation Ordinance (No. 4 of 1974)	Guides conservation and control of problem animals	Relevant for wildlife protection along the corridor
Nature Conservation Act (No. 5 of 1996)	Provides for sustainable wildlife management and conservancies	Ensures biodiversity protection
Forest Act (No. 12 of 2001)	Governs sustainable forestry and biodiversity conservation	Guides vegetation clearance and re-vegetation
National Heritage Act (No. 27 of 2004)	Protects heritage sites and objects	Ensures safeguarding of cultural/heritage features
Soil Conservation Act (No. 76 of 1969)	Provides for prevention and control of soil erosion	Relevant for borrow pit rehabilitation and erosion control
Hazardous Substances Ordinance (No. 14 of 1974)	Regulates handling and disposal of hazardous substances	Applies to fuel, oil, and chemical storage

3.3 Environmental and Resource Policies

Policy	**Key Provision**	**Relevance to Project**
Pollution Control & Waste Management Bill (1999)	Promotes integrated pollution prevention and control	Guides dust, noise, and waste management
National Waste Management Policy (2010)	Provides framework for integrated waste management	Ensures proper waste segregation and disposal
Draft Wetlands Policy (2004)	Promotes conservation and sustainable use of wetlands	Relevant for drainage and water resource protection
Community-Based Tourism Policy (1995)	Encourages community-run tourism enterprises	Supports socio-economic benefits linked to improved access

3.4 Roads Authority Manuals & Guidelines

Manual	Purpose
Procedures Manual (2014)	Standardised processes for road projects
Materials Manual (2014)	Specifications for construction materials
Structures Manual (2014)	Guidance on culverts, bridges, and drifts
Drainage Manual (2014)	Standards for side drains, mitre drains, culverts
Survey Manual (2014)	Surveying requirements for alignment and works
Geometrics Manual (2014)	Road design standards
Environmental Manual (2014)	Environmental safeguards during road projects
Construction Manual (2014)	Technical specifications for construction
Economic Evaluation Manual (2014)	Cost-benefit analysis framework
Standard Drawings Manual (2014)	Approved design drawings

4. ROLES AND RESPONSIBILITIES

Effective implementation of the EMP for the DR3469 Mbeyo–Erago Gravel Access depends on clear accountability, defined lines of reporting, and consistent oversight across all parties. This section consolidates and standardizes roles from both source documents.

4.1 Institutional framework

Table 6: Institutional framework

Role-player	Institution	Core responsibility
Proponent	Roads Authority (RA)	Overall accountability; ensure EMP compliance and resource allocation
Resident Engineer (RE)	Trinitas Consulting Engineers	Technical supervision; EMP enforcement on site; approvals and audits
Environmental Consultant (EAP)	Ritta Khiba Planning Consultants (RKPC)	EMP development, updates, advisory support, and compliance guidance
Environmental Compliance Officers (ECOs)	MEFT	Independent compliance monitoring, spot checks, enforcement actions
Health, Safety & Environment (HSE) Officer	Contractor	Day-to-day EMP implementation, training, inspections, reporting
Contractor (and Sub-contractors)	Appointed Contractor	Execute works per EMP, RA manuals, method statements, and permits
Kavango West Regional Council	Regional Authority	Liaison, oversight of local concerns, integration with regional priorities
Interested & Affected Parties (I&APs)	Communities, institutions	Report concerns, participate in consultations, inform access needs

Lines of reporting: Contractor/HSE Officer → RE → RA (operational chain) and ECOs → RA/RE (regulatory chain). Community inputs flow via I&APs → Regional Council/RA/RE.

4.2 Detailed Roles and Responsibilities

Table 7:Roles and Responsibilities

Role-Player	Core Responsibilities
Roads Authority (RA)	Overall accountability; resource allocation; enforce EMP compliance; review Contractor's Management Plan; convene monthly site meetings; maintain complaint/incident register
Resident Engineer (RE)	Site supervision; designate sensitive "No-Go" zones; approve method statements and rehabilitation plans; conduct inspections; authorize corrective actions or work stoppages
Environmental Consultant (EAP)	Develop and update EMP; provide technical guidance; support induction and toolbox talks; advise RA/RE/Contractor on mitigation and monitoring
Environmental Compliance Officers (ECOs – MEFT)	Independent monitoring; perform spot checks; enforce ECC conditions; issue warnings or penalties; submit compliance reports to RA/RE
Contractor	Execute works per EMP and RA manuals; appoint HSE Officer; prepare Contractor's Management Plan; conduct training; submit monthly environmental and H&S reports
HSE Officer (Contractor)	Daily EMP implementation; monitor PPE use, spill prevention, housekeeping; maintain permits and inspection records; liaise with RE and communities
Kavango West Regional Council	Facilitate communication between communities and RA; integrate local priorities; coordinate with traditional authorities
Interested & Affected Parties (I&APs)	Participate in consultations; raise concerns (pollution, UXO, relocation); report grievances via established channels

4.3 Reporting Structure

Reporting Line	Flow of Information
Contractor / HSE → Resident Engineer	Daily site reports; incident notifications; compliance updates
Resident Engineer → Roads Authority	Weekly progress reports; non-compliance records; stakeholder summaries
ECOs → RA / RE	Compliance audit findings; enforcement recommendations
EAP → RA / RE	Technical guidance; monthly compliance support
RA → MEFT	Consolidated EMP compliance reports; project updates
I&APs / Regional Council → RA / RE / ECOs	Grievances, access needs, safety alerts

4.4 Compliance Meetings & Documentation

Meeting / Document	Purpose	Responsible Party
Monthly Site Meetings	Review EMP performance, incidents, corrective actions, upcoming high-risk activities	RA (Chair), RE, Contractor, EAP, ECOs
Compliance File	Maintain ECC, permits, method statements, inspection forms, training records, incident reports	Contractor / RE
Change Log	Record EMP updates and decisions affecting mitigation measures or site layouts	RE / EAP
Grievance Register	Track complaints and resolutions	ECO / RE

5. THE CONTRACTOR'S MANAGEMENT PLAN AND TRAINING

5.1 Contractor's Management Plan

Table 8:Contractors Management Plan

Component	Description
Waste Management Plan	Procedures for segregation, storage, and disposal of waste streams
Dust Suppression Plan	Measures for watering, speed control, and dust monitoring
Borrow Pit Rehabilitation Plan	Stepwise rehabilitation actions (backfilling, drainage, vegetation, fencing)
Traffic Accommodation Plan	Temporary signage, traffic control, and safe passage measures
Emergency Response Plan	Protocols for accidents, spills, UXO incidents, and community alerts
Method Statements	Detailed descriptions of construction activities, equipment use, and mitigation measures
Drawings & Site Layouts	Identification of borrow pits, stockpile areas, "No-Go" zones, and rehabilitation areas
Monitoring Programme	Inspection schedules, reporting formats, corrective action procedures

5.2 Training & Awareness

Training Type	Target Group	Content	Frequency
Induction Training	All staff & sub-contractors	EMP requirements, safety protocols, reporting procedures, community relations	Mandatory before work starts
Specialized Training	Staff handling hazardous substances, heavy machinery operators, sensitive environment workers	Safety procedures, environmental safeguards	As required

Refresher Training	All staff	Reinforce compliance, address emerging issues	Periodic
Toolbox Talks	Site workers	Specific risks, upcoming activities	Regular short sessions
Record Keeping	Contractor	Maintain training registers; submit to RE & RA	Continuous

5.3 Reporting & Accountability

Report Type	Content	Frequency	Recipient
Monthly Environmental Management Report	Training status, weekly inspection forms, incident summaries, corrective actions	Monthly	Resident Engineer & Roads Authority
Weekly Site Inspection Forms	Observations on EMP compliance, dust/noise/waste management, borrow pit rehabilitation	Weekly	Resident Engineer
Incident Reports	Accidents, spills, infringements, corrective actions taken	As required	Resident Engineer & ECOs
Training Records	Induction, refresher, toolbox talks	Continuous	Resident Engineer & RA

6. COMMUNICATION, RECORD KEEPING, DOCUMENT CONTROL AND COMMUNITY RELATIONS

6.1 Communication and Reporting

Effective communication is essential to ensure transparency, accountability, and timely resolution of issues. The Contractor must:

a) Establish clear communication channels with the Resident Engineer (RE), Roads Authority (RA), Environmental Consultant, and Environmental Compliance Officers (ECOs).
b) Provide monthly reports to the RE and RA covering environmental management, health and safety, training, inspections, and incidents.
c) Notify immediately in the event of accidents, infringements, or environmental incidents.
d) Discuss EMP issues at every monthly site meeting, with input from RA, RE, Contractor, ECOs, and other stakeholders.
e) Maintain a complaints register to document concerns raised by communities or I&APs, and report these to the RE and RA.

6.2 Record Keeping and Document Control

The Contractor must maintain accurate and up-to-date records to demonstrate compliance with the EMP. These include:

a) Site inspection forms (daily and weekly).
b) Training records for all staff and sub-contractors.
c) Permits, licenses, and approvals relevant to construction activities.
d) Incident and accident reports, including corrective actions taken.
e) Waste management records, including disposal manifests.
f) Borrow pit rehabilitation records, including monitoring results.

All records must be stored securely, be accessible for audits, and be submitted to the RE and RA upon request. Document version control must be applied to avoid inconsistencies.

6.3 Community Relations

Community engagement is critical to the success of the project. The Contractor, in collaboration with RA and RE, must:

a) Conduct stakeholder consultations to inform communities about project activities, timelines, and potential impacts.
b) Provide advance notice of construction activities that may affect access, services, or safety.

c) Establish a grievance mechanism for community members to raise concerns, with clear procedures for logging, investigating, and resolving complaints.
d) Ensure access points and intersections are determined through consultation with local communities to maintain connectivity to schools, clinics, and villages.
e) Promote transparency by sharing monitoring results and compliance updates with I&APs and the Kavango West Regional Council.

7. COMPLIANCE WITH EMP

7.1 Mandatory Compliance

Table 9:Mandatory Compliance

Aspect	Requirement
Legal Binding	EMP is enforceable under Environmental Management Act (No. 7 of 2007) and EIA Regulations (2012)
Contractual Obligation	EMP clauses incorporated into tender and contract documents
ECC Conditions	All activities must comply with Environmental Clearance Certificate requirements

7.2 Monitoring & Auditing

Responsible Party	Monitoring Activity	Frequency
Resident Engineer (RE)	Routine site inspections; verify EMP implementation	Weekly
Contractor / HSE Officer	Daily site checks; maintain logs (dust, waste, borrow pits)	Daily
Environmental Compliance Officers (ECOs – MEFT)	Independent spot checks; compliance audits	Unannounced / Monthly
Environmental Consultant (EAP)	Technical guidance; monthly compliance support	Monthly

7.3 Reporting Requirements

Report Type	Content	Frequency	Recipient
Contractor's Monthly Report	Training status, inspection forms, incidents, corrective actions	Monthly	Resident Engineer & RA
RE's Consolidated Report	Site performance, non-compliance records, stakeholder engagement	Monthly	Roads Authority

ECO Compliance Report	Audit findings, enforcement recommendations	Monthly / As needed	RA & MEFT
RA Submission	Consolidated EMP compliance report	Quarterly	MEFT

7.4 Enforcement Mechanisms

Non-Compliance Type	Enforcement Action
Minor infringement (e.g., dust suppression lapse)	Warning; corrective action within defined timeframe
Moderate infringement (e.g., improper waste disposal)	Fine; mandatory corrective measures
Serious infringement (e.g., UXO clearance ignored, heritage site damage)	Work stoppage; suspension of ECC; possible legal action

7.5 Continuous Improvement

Mechanism	Purpose
Lessons Learned	Integrate findings from audits and incidents into updated EMP
Best Practices	Adopt new industry standards and RA guidelines
Adaptive Management	Revise mitigation measures when unforeseen impacts arise
Stakeholder Feedback	Use community input to refine EMP implementation

8. PROCEDURES REGARDING NON-COMPLIANCE

Non-compliance with the EMP can undermine environmental safeguards, community trust, and regulatory approvals. To ensure accountability, the following procedures will be applied consistently across all parties.

8.1 Step-by-Step Procedure

Table 10: Non compliance procedures

Step	Action	Responsible Party	Notes
1	Identification of non-compliance during inspections, audits, or community reports	Resident Engineer, ECOs, Contractor	Examples: dust suppression failure, waste mismanagement, borrow pit misuse
2	Notification of non-compliance	Resident Engineer → Contractor; ECOs → RA/RE	Written and verbal communication required
3	Corrective action plan prepared	Contractor	Must outline remedial measures, timelines, and responsible staff
4	Implementation of corrective measures	Contractor, HSE Officer	Actions must be documented and verified
5	Verification of compliance	Resident Engineer, ECOs	Follow-up inspections/audits to confirm resolution
6	Penalties or enforcement if corrective action fails	Roads Authority, ECOs	Fines, warnings, license suspension, or work stoppages
7	Escalation of serious infringements	RA/RE → MEFT	For persistent or high-risk violations (e.g., UXO safety breaches)

8.2 Penalties and Enforcement

Non-Compliance Type	Penalty / Enforcement Action	Authority
Minor infringement (e.g., dust suppression lapse)	Written warning; corrective action within timeframe	RE
Moderate infringement (e.g., improper waste disposal, borrow pit mismanagement)	Fine; mandatory corrective measures	RA / RE
Serious infringement (e.g., UXO clearance ignored, heritage site damage, repeated violations)	Work stoppage; suspension of ECC; possible legal action	RA / MEFT

8.3 Documentation

Document Type	Purpose	Responsible Party
Compliance Register	Record all incidents, corrective actions, and resolutions	Contractor / RE
Incident Report	Detail nature of non-compliance, actions taken, and outcomes	Contractor / HSE Officer
Corrective Action Log	Track implementation and verification of corrective measures	RE / ECO
Monthly Compliance File	Consolidated record of incidents, penalties, and resolutions	RA
MEFT Submission	Regulatory reporting of serious infringements	RA / ECO

9. PROPOSED MITIGATION MEASURES TO BE PERFORMED

The construction of the DR3469 Mbeyo–Erago Gravel Access (20.5 km) will generate environmental and social impacts. The following mitigation measures are proposed and organized into specific tables for clarity.

9.1 Vegetation and Biodiversity

Table 11: Proposed mitigation measures

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Vegetation loss	Limit clearing to road corridor; mark "No-Go" zones	Area cleared vs. approved corridor	Contractor, RE
Biodiversity disturbance	Avoid sensitive habitats; relocate protected species if encountered	Records of relocation; ECO reports	Contractor, ECOs

9.2 Soil and Erosion Control

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Soil erosion	Construct mitre drains, silt fences, contour banks	Presence of erosion features	Contractor
Disturbed areas	Rehabilitate slopes with topsoil and vegetation	Rehabilitation progress	Contractor, ECOs

9.3 Dust Control

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Dust from vehicles	Water spraying; enforce speed limits	Dust levels; spraying frequency	Contractor, HSE Officer
Dust from stockpiles	Cover or wet stockpiles	Stockpile condition	Contractor

9.4 Noise Management

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Construction noise	Restrict working hours; maintain machinery	Noise monitoring logs	Contractor
Worker exposure	Provide PPE (ear protection)	PPE availability	Contractor, HSE Officer

9.5 Waste Management

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Solid waste	Segregate waste; provide bins; dispose at approved sites	Waste manifests; site cleanliness	Contractor
Hazardous waste	Store fuels/oils in bunded areas; spill kits available	Spill records; bund integrity	Contractor, HSE Officer

9.6 Water Resources

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Runoff contamination	Construct side drains; prevent discharge into streams	Water quality tests	Contractor, ECOs
Wastewater	Manage wastewater per permits; avoid stagnant pools	Drainage inspections	Contractor

9.7 Traffic and Road Safety

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Traffic disruption	Provide bypasses; consult communities on access points	Access routes maintained	Contractor, RA
Road safety	Install signage; enforce speed limits; provide flagmen	Accident records; signage in place	Contractor, RE

9.8 UXO Risk

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
UXO hazards	Suspend excavation until clearance by authorities	Clearance certificate	RA, ECOs, Police
Worker safety	Train staff in UXO awareness	Training records	Contractor

9.9 Employment and Social Benefits

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Local employment	Prioritize local hiring; fair wages	% of local workers employed	Contractor
Skills development	Provide training and capacity building	Training records	Contractor

9.10 Stakeholder Engagement

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Community grievances	Establish grievance mechanism; hold meetings	Complaints register	Contractor, RA
Access needs	Consult communities on intersections and borrow pits	Meeting minutes	Contractor, Regional Council

9.11 Borrow Pit Rehabilitation

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Excavation	Limit excavation to approved pits	Pit dimensions vs. plan	Contractor, RE
Rehabilitation	Backfill pits; contour slopes; replant vegetation	Rehabilitation progress reports	Contractor, ECOs
Safety	Fence active pits; provide signage	Signage/fencing in place	Contractor
Community use	Consult communities on post-rehabilitation land use	Consultation records	RA, Regional council

10. SPECIFIC BORROW PITS REHABILITATION MEASURES

Borrow pits are critical for sourcing construction material but can leave long-term environmental scars if not properly managed. Rehabilitation measures must be implemented to restore ecological integrity, ensure safety, and maintain community trust.

10.1 Excavation Phase

Table 12: Specific borrow pits rehabilitation measures

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Over-extraction	Limit excavation to approved pits and volumes	Pit dimensions vs. approved plan	Contractor, RE
Habitat disturbance	Avoid clearing beyond pit boundaries; mark "No-Go" zones	Site inspection records	Contractor, ECOs

10.2 Backfilling and Contouring

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Unsafe slopes	Backfill pits with overburden; contour slopes to natural profile	Slope stability checks	Contractor
Soil erosion	Apply topsoil and stabilize with vegetation	Rehabilitation progress reports	Contractor, ECOs

10.3 Drainage Management

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Waterlogging	Construct cut-off drains; prevent standing water	Drainage structures in place	Contractor
Erosion	Stabilize drainage channels with vegetation or stone pitching	Erosion signs	Contractor, ECOs

10.4 Vegetation Restoration

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Loss of cover	Replant indigenous species; seed grass for quick cover	Vegetation cover %	Contractor
Poor regrowth	Apply mulch/topsoil; monitor survival rates	Survival rate of plants	Contractor, ECOs

10.5 Safety and Security

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Accidents	Fence active pits; install warning signage	Signage/fencing in place	Contractor
Post-use hazards	Remove temporary structures; level dangerous edges	Incident reports	Contractor, RE

10.6 Community Use and Closure

Impact	Mitigation Measure	Monitoring Indicator	Responsible Party
Post-rehabilitation land use	Consult communities on future use (grazing, agriculture, water storage)	Consultation records	RA, Regional Council
Closure certification	ECOs and RE to certify rehabilitation completion	Closure reports	RA, ECOs

10.7 Monitoring and Reporting

- **Contractor:** Implements rehabilitation measures and submits monthly progress reports.
- **Resident Engineer (RE):** Verifies rehabilitation activities and approves completed sites.
- **Environmental Compliance Officers (ECOs):** Conduct independent audits and enforce corrective actions.

- **Roads Authority (RA):** Maintains a rehabilitation register and ensures compliance with ECC conditions.

10.8 Closure and Certification

- Rehabilitation must be certified by the Resident Engineer and ECOs before pits are considered closed.
- Certification requires evidence of backfilling, slope stabilization, vegetation regrowth, and removal of hazards.
- Final closure reports must be submitted to RA and MEFT for regulatory compliance.

11. PUBLIC CONSULTATION PROCESS

Public consultation was undertaken as part of the Environmental Impact Assessment (EIA) process to ensure transparency, inclusivity, and accountability in project planning. Meetings were held from 27–29 January 2026 in the villages of Mbeyo, Sihetekera, and Erago within the Ncamangoro Constituency, Kavango West Region. These consultations engaged traditional leaders, constituency representatives, community members, youth, women, and directly affected households.

The consultations provided communities with an opportunity to raise expectations, concerns, and aspirations regarding the proposed DR3469 Mbeyo–Erago road upgrade. Attendance was strong, reflecting the importance of the project as the first major road development in the constituency since independence.

11.1 Stakeholder Category

Table 13:Stakeholder Category

Stakeholder Group	Role in Consultation / Project
Traditional Authorities	Custodians of communal land; facilitated mobilisation and access
Constituency Leaders & Regional Council	Provided oversight, integration with regional priorities
Erago Primary School & Clinic Staff	Direct beneficiaries of improved access and safety
Village Development Committees (Mbeyo, Sihetekera, Erago)	Liaisons for grassroots consultation, grievance resolution, and labour mobilisation
Local Farmers, Youth & Women's Associations	Raised livelihood, employment, and safety concerns
Directly Affected Households	Expressed concerns about compensation and relocation
Broader I&APs (NGOs, SMEs, institutions)	Provided perspectives on socio-economic and environmental impacts

11.2 Key Issues Raised

Theme	Concern Raised
Employment & Recruitment	Requests for household quotas, prioritisation of locals, youth opportunities, and transparent recruitment processes
Business & Livelihoods	Calls for designated trading areas, mobile vending opportunities, and facilities to support small-scale enterprises
Infrastructure & Development Needs	Requests for electricity supply, water points (especially between Mbeyo and Erago), and a communal garden to offset agricultural land loss
Directly Affected Households	Concerns about compensation and relocation for households impacted by the alignment
Road Alignment	Discrepancy between design presented locally and version submitted to the Governor's office; preference for a straight-line alternative to reduce accident risks and minimise land parcel loss

11.3 Recommended Responses / Management Actions

Stakeholder Comment	Engineer's Response (Trinitas Consulting Engineers)	Integration into EMP
Community members raised concerns about the road alignment, noting that the proposed route may increase accidents and cause unnecessary land loss. They suggested a straight-line alternative.	**Engineer's Response:** The alignment was deliberately chosen to provide improved access to the immediate community and surrounding villages, while strategically accommodating future connectivity toward **Matende**. From a technical perspective, the connection to the national road requires controlled turning geometry rather than a straight-line intersection. This	EMP includes traffic safety measures (controlled junction design, signage, speed reduction), access management provisions (maintaining existing routes), and community engagement commitments to explain alignment decisions.

	reduces vehicular speeds, improves driver reaction time and sight distance, and minimizes collision risks. The straight-line alternative would compromise junction safety and increase accident risk. Existing access roads will remain operational during construction and for future maintenance.	
Request for fair and transparent recruitment, prioritizing local households and youth.	**Engineer's Response:** Recruitment frameworks will prioritize local residents, with transparent processes to ensure fairness.	EMP includes socio-economic mitigation measures: local hiring targets, fair recruitment procedures, and monitoring of labour practices.
Desire for opportunities for small-scale businesses along the corridor.	**Engineer's Response:** Designated trading areas will be established to support local enterprises.	EMP includes socio-economic enhancement measures: allocation of trading zones, monitoring of informal business development.
Request for provision of water points and electricity along the road.	**Engineer's Response:** Requests documented and forwarded to relevant ministries; project scope limited to road construction but coordination will be pursued.	EMP includes liaison measures: documentation of requests, referral to ministries, and monitoring of community infrastructure needs.
Concern about agricultural land loss; request for communal garden to offset impacts.	**Engineer's Response:** Household-level assessments will be conducted for compensation or relocation; communal garden proposal noted for integration with regional development plans.	EMP includes land use mitigation: compensation/relocation procedures, support for alternative livelihood initiatives.
Concern about dust, noise, and waste	**Engineer's Response:** Dust suppression, noise control, and waste management measures will	EMP includes dust suppression plan, noise monitoring, and waste management protocols.

mismanagement during construction.	be implemented per RA standards.	
Concern about safety hazards (livestock crossings, UXO risk).	**Engineer's Response:** Controlled junction design, signage, and UXO clearance protocols will be implemented before construction.	EMP includes traffic safety measures, UXO clearance procedures, and community awareness campaigns.

Supporting documentation is attached:

Annexure A - Attendance registers (Mbeyo, Sihetekera, Erago).

Annexure B – Notices/invitations and any written submissions.

Annexure C – Public Participation Report

Annexure D - Meetings minutes

12. CONCLUSION

The upgrading and construction of the DR3469 Mbeyo–Erago Gravel Access in the Kavango West Region represents a strategic intervention to address long-standing mobility constraints, improve access to essential services, and stimulate socio-economic development. The project will transform a deep sand track into a durable gravel access road, providing year-round connectivity for schools, clinics, agricultural producers, and dispersed rural communities.

The Environmental Management Plan (EMP) has identified potential biophysical and socio-economic impacts associated with the project. These include vegetation clearance, soil erosion, dust emissions, noise, waste mismanagement, borrow pit degradation, and safety risks such as unexploded ordnance (UXO). Through the mitigation measures outlined in Sections **9** and **10**, these impacts are considered manageable and reversible.

Key strengths of the EMP include:

- Comprehensive mitigation measures for environmental and social impacts.
- Clear institutional roles and responsibilities ensuring accountability across RA, RE, Contractor, ECOs, and communities.
- Borrow pit rehabilitation measures to restore ecological integrity and ensure safety.
- Public consultation process that documented community concerns and integrated them into project planning.
- Monitoring and enforcement mechanisms to ensure compliance with legislation and Roads Authority standards.

The EMP concludes that the proposed project is environmentally and socially acceptable, provided that all mitigation measures are fully implemented and compliance is strictly monitored. The project is expected to:

- Enhance regional integration by linking rural communities to the B8 national road.
- Reduce travel times and vehicle operating costs.
- Improve access to education, healthcare, and markets.
- Create local employment opportunities during construction and operation.
- Strengthen community resilience and contribute to Namibia’s broader development goals.

Approval of the project is recommended, subject to strict adherence to the EMP, continuous monitoring by ECOs, and transparent engagement with stakeholders. The EMP should remain a living document, updated as new information, best practices, or unforeseen impacts arise during implementation.