

Environmental Management Plan

Mining of Gravel Materials (G7) from an **Existing** Borrow Pit for Use in Backfilling and Road Construction. The Borrow Pit is Situated on Portion 111 (a Portion of Portion 39) of the Consolidated Farm Tsumore No. 761, Tsumeb, Oshikoto Region



APP007393

May 2026

Prepared for

Rainy Day Investments 37 (Pty) Ltd

Prepared by

Ekwao 
Consulting

INFORMATION SHEET


Project Title Name	Environmental Management Plan To Support an Application of an Environmental Clearance Certificate to Permit the Undertaking of a Listed Activity. Mining of Gravel Materials (G7) from an Existing Borrow Pit for Use in Backfilling and Road Construction. The Borrow Pit is on Portion 111 (a Portion of Portion 39) of Consolidated Farm Tsumore No. 761, Situated within the Expanded Boundaries of Tsumeb Municipality Tsumeb, Oshikoto Region
ECC Application No.	APP007393
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ABBREVIATIONS AND ACRONYMS

TERM	EXPANSION
BAT	Best Available Technology
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
FSC	Forest Stewardship Council
GIS	Geographical Information System
GSN	Geological Services of Namibia
I&APs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MW	Mega watts
NamRa	Namibia Revenue Authority
NHC	National Heritage Council
NSI	Namibia Standards Institute
OBPP	Otjikoto Biomass Power Plant
PPE	Personal Protective Equipment
RD37	Rainy Day Investments 37 (Pty) Ltd
SHE	Safety, Health & Environment
SME	Small and Medium Enterprises
TM	Tsumeb Municipality

GLOSSARY OF TERMS AND DEFINITIONS

TERM	DEFINITION
Activity	Is definite in the Act as physical work that a proponent proposes to construct, operate, modify, decommission or abandon or an activity that a proponent proposes to undertake;
Aggregates	In Namibia “aggregate” typically refers to crushed stone, sand and gravel used in the construction industry. It serves as the primary structural filler in concrete, asphalt, and road bases. When using a square sieve with an aperture of 4.75 mm, 90% of sand will pass through a square sieve whilst at least 90% of coarse stone will be retained by such a sieve. The coarse stones retained on the sieve will constitute aggregates.
Alternatives	Means a possible course of action in place of another, or different means of meeting the general purpose and requirements of the activity, which may include alternatives to - (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; and (e) the operational aspects of the activity. The ‘No-Go’ alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes, development should result in net benefits to society and should avoid undesirable negative impacts.
Anthropogenic Impact	Human impacts on the environment which include changes to the biophysical environments, ecosystems, biodiversity and natural resources caused directly or indirectly by human activities including global warming, environmental degradation, etc.
Assessment	The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making
Borrow Pit	Means an excavated area where soil, sand, gravel or other earth materials are available for construction projects. These materials, often called ‘borrow’ can be used for creating backfilling, roadbed elevation, embankments, landscaping, and other structural components.
G7 Gravel	In civil engineering and road construction, G7 typically refers to a specific classification of natural or crushed gravel or soil used as a sub-base layer. It provides a stable, load-bearing foundation beneath the upper base course and paved surface.
Competent Authority	As definite in the Act, means any government ministry, regional or local authority, traditional authority or statutory body that has administrative jurisdiction over a proposed project or listed activity.
Construction	Means the building, erection or modification of a facility, structure or infrastructure that is necessary for undertaking of an activity, including the modification, alteration, upgrading or decommissioning or rehabilitation of a facility, structure or infrastructure.
Cumulative Impacts	In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decommissioning	The process which begins after termination or cessation of mining activities or mineral processing and ends with closure. It involves, amongst others, the removal of unwanted infrastructures, making safe of the dangerous excavations and surface restoration so as to minimise the adverse environmental impacts of mining activities remaining after cessation of operation.
Diversity	Means the variability among living organisms from all sources, including amongst others, terrestrial and aquatic ecosystems and the ecological complexes of which they are part, and this includes diversity within species, between species and of ecosystems;
Environment	As defined in the Environmental Assessment Policy and Environmental Management Act - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.
Environmental Clearance Certificate	A certificate and associated conditions issued in terms of the Environmental Management Act, authorizing a listed activity to be undertaken.

Environmental Impact	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Environmental Management Plan	A working document which contains site project specific plan developed to ensure that environmental management practices to eliminate and control environmental impacts are followed during the developmental phases of that site, project and or facility and would normally consist of construction phase, operational phase and decommissioning phases.
Evaluation	Means the process of ascertaining the relative importance or significance of information, the light of people's values, preference and judgements in order to make a decision.
Gravel Reserve	A reserve is that amount of the resource which has been quantitatively proven through drilling and other sampling methods for which the level of confidence is high.
Gravel Resource	The extent of extractable volume is estimated with a low level of confidence, i.e. the resource is only inferred (estimated) from geological evidence and assumptions but has not been verified via drilling and other applicable sampling methods.
Hazard	Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.
Interested and Affected Party	Any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
Mitigate	The implementation of practical measures to reduce adverse impacts.
Significant Effect/Impact	Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Non-compliance	Issues that are in direct non-compliance with the requirements, commitments and/or management measures as approved in the EMP.
Pollution	Means any change in the environment caused by – (a) any waste, substance or matter; or (b) noise, odour, dust or heat, emitted from or caused by any activity, including the storage or treatment of any waste, substance or matter, building and construction, and the provision of any service, whether engaged in by any person or an organ of state if that change has an adverse effect on public health or well-being.
Proponent	As definite in the Act means a person who proposes to undertake a listed activity;
Quarry	A type of open-pit mine where rocks, gravel and /or minerals are extracted.
Quarrying	Means a method of extracting construction materials from an open surface, i.e. building stones, slates, marbles, building sand either by drilling or blasting or cutting or simply excavation. Quarries principally produce sand and gravel and crushed rock for construction and these materials are usually described as 'aggregates'
Sensitive Area	A sensitive area or environment is described as an area or environment where a unique ecosystem, habitat for plant and animal life, wetlands or conservation activity exists or where there is high potential for ecotourism.

1. PROJECT BACKGROUND

1.1 Introduction

Rainy Day Investments 37 (Pty) Ltd (**RD37**) owns a 500-hectare commercial farmland within the expanded boundary of the Tsumeb Municipality in the Oshikoto region. Situated southwest of Tsumeb, the property abuts the B1 highway to the north and the railway line to the west. On the said farmland, there is an **existing** borrow pit that has been used for over 40 years to excavate G7-graded gravel for backfilling and road construction.

Gravel mining is a listed activity which may not be undertaken without an Environmental Impact Assessment (EIA) having been conducted and an Environmental Clearance Certificate (ECC) granted by the Environmental Commissioner (EC) in the Ministry of Environment, Forestry and Tourism (MEFT).

It is the expressed intention of RD37 to realign its gravel extraction activities with the requirements of the Environmental Management Act, and accordingly appointed Ekwa Consulting (**Ekwa**) to handle its ECC application process.

1.2 Purpose of this EMP

This document constitutes the Environmental Management Plan (EMP) prepared to serve as a standalone document to address adverse impacts associated with gravel mining from the aforesaid borrow pit. It has been prepared to support an application for an ECC submitted to OEC.

The EMP is an actionable, project-specific roadmap that outlines how potential environmental and socio-economic impacts as identified during the scoping assessment are mitigated, monitored, and managed throughout the lifespan of the project – planning, construction/operation and decommissioning.

In terms of EIA Regulations, a 'Management Plan' is defined as*"A plan that describes how activities that may have significant environmental effects on the environment are to be mitigated, controlled and monitored"*

The contents of this EMP will be binding on all parties who will have a role to play in the gravel mining activities as stipulated in the scoping assessment, and will be liable for the rehabilitation measures recommended in this document.

1.3 EMP Requirements

In section 8 of the EIA Requirements, the requirements for an EMP are outlined as follows:

j. A draft management plan which includes:

aa) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation and closure;

bb) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and

cc) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants

1.4 EMP Objectives

The EMP is intended to:

- Ensure compliance with the conditions attached to the ECC once it has been approved and granted by the EC.
- Ensure that practical measures are implemented to prevent, avoid, minimize, mitigate or rehabilitate areas impacted by gravel mining.
- Conserve significant aspects of the biophysical and socio-economic environments including the protection of human health and safety of the personnel and individual members of the general public who may be visiting the borrow pit from time to time.
- Develop workable methods which ensure that the gravel mining is carried out in a manner which is financially feasible, technically sound, socially acceptable and environmentally sustainable.



Figure 1: Borrow Pit in Relation to the Biomass Power Plant

2. MECHANISM FOR IMPLEMENTING THE EMP

In this section details on the mechanisms proposed for the implementation of the EMP are outlined:

- Roles and Responsibilities
- Compliance and non-compliance
- Proposed Penalties for Minor Environmental Violations
- Environmental awareness training
- Monitoring and Reporting
- Reviews
- Environmental emergencies, incidents and accidents
- Complying with mitigation measures

2.1 Roles and Responsibilities

This section outlines the roles and responsibilities of the respective key personnel that would be responsible for effective implementation of the EMP.

Assigning responsibilities is necessary to ensure that key procedures are followed. The purpose of this section is to define roles for personnel and to detail their respective responsibilities in the execution of the EMP. The key role-players for project implementation are:

Table 1: Functions and Responsibilities

Party Responsible	Functions /Roles/Responsibilities
Office of the Environmental Commissioner (OEC)	<p>Amongst the roles of the OEC as it pertains to this project are:</p> <ul style="list-style-type: none"> • Granting of the ECC • Enforcing compliance with the terms of the ECC & EMP • Reviewing this EMP and any future revisions thereof. • Undertaking site audits and inspections at their discretion. • Reviewing annual audit reports. • Reviewing serious onsite incidents and accidents reports. • Enforcing legal mechanisms for contraventions of the ECC.
Rainy Day Investments 37 (Pty) Ltd / (RD37)	<p>During the planning, operational (business phase) and rehabilitation, the overall management and responsibilities of gravel mining will be vested in RD37 Management. In turn, RD37 has the flexibility to appoint persons with suitable qualifications and experiences to handle the day-to-day management of gravel extraction, i.e. Borrow Pit Manager (BPM) whose functions are amongst others to:</p> <ul style="list-style-type: none"> • Manage the day-to-day operational activities for the gravel extraction/mining from the borrow pit, and to ensure that such activities are executed in compliance with the relevant legislations and the terms of the EMP. • Ensure that the necessary environment authorizations and permits are obtained and kept on file at the site office. • Maintain the general communications with stakeholders and authorities and to inform on any planned activities where relevant. • Report any significant environmental incidents, accidents and or emergencies to the relevant local authority.

Party Responsible	Functions /Roles/Responsibilities
	<ul style="list-style-type: none"> • Ensure that all vehicles used in the operated that are on public roads are licensed and fully compliant with road regulations. • Facilitate the appointment of at least one Safety Officer to be in charge of the borrow pit. • Undertake induction training for all existing personnel and those who may be hired in future to ensure that the environmental values, potential impacts, management measures and emergency responses are understood and implemented. • Undertake monthly inspections of the borrow pit for the purpose of assessing on-site implementation of the EMP and to ascertain the effectiveness of the prescribed mitigation measures. • Perform internal audits and to prepare an environmental report once yearly for submission to MEFT. • Act as a company liaison officer, responding to any queries and or complainants received from the members of the public. • When conducting the EMP induction training, the presentation should be conducted, as far as possible, in the employees' language of choice.
Environmental Compliant Office (ECO)	<p>In the context of the report, the Environmental Compliant Officer (ECO) refers to the party responsible for the environmental compliance and auditing activities required by the EMP during the e lifecycle of the borrow pit activities.</p> <p>Ideally, the ECO should be an independent consultant who has adequate environmental knowledge to understand the detailed environmental issues associated with the project, and is to be well versed in the contents of the EMP and related reports. The ECO shall:</p> <ul style="list-style-type: none"> • Undertake all monitoring and auditing activities to ensure compliance with the EMP. • Inspect the borrow pit site prior to any preparation activities commencing; at least once (1) a month during operation; on completion of any progressive rehabilitation and re-vegetation activities per phase; and on final closure of the site. • Compile Progress Reports following any site inspections (including progressive rehabilitation inspections), Compliance Reports following any non-compliances, and a Closure Report following the conclusion of mining and eventual closure of the site. • Liaise closely with the Borrow pit Manager and Town Engineer, and shall provide guidance on any environmental management issues, incidents or emergencies that are brought to their attention. • Assist in providing recommendations for remedial action in the event of any non-compliances.

2.2 Non-compliance

This EMP becomes a legally binding document once approved and written confirmation to this effect given through the issuance of an ECC. The provisions and mitigation details given in this EMP must be strictly adhered to, and complied with by the proponent.

RD37 Management should act immediately when a notice of non-compliance has been received and take corrective action. The provisions of the EMP are deemed to have been violated in these instances:

- There is evidence of contravention of the EMP specifications within and or outside of the borrow pit area.
- Environmental damage ensues due to negligence.
- Mining activities taking place outside the defined boundaries of the borrow pit.
- RD37 fails to adequately address complaints from stakeholders or IAP's.

2.3 Proposed Penalties for Minor Environmental Violations

It is recommended that RD37 Management, in its employees' code of conducts, institutes penalties for the following less serious environmental violations, and others determined during the course of the work as detailed below:

- Willful littering on site.
- Persistent or unrepaired fuel and oil leaks.
- Non completion of pre-start checks for machinery & equipment.
- Any person or vehicle or equipment found within an area designated as a 'No-Go' area.
- Possession or use of intoxicating substances (drugs or liquor) whilst on duty.
- Possession of a firearm whilst on duty or on the company premises.
- Coming to work under the influence of alcohol.
- Any vehicle being driven in excess of designated speed limits.
- Failure to wear PPE when working in areas where wearing of PPE is mandatory.
- Failure to wear a seatbelt when driving a vehicle which is fitted with a seatbelt.
- Removal and or damages to fauna, flora or to any cultural heritage objects on site.
- Urination and defecation anywhere other than using designated facilities on site.

2.4 Environmental Awareness Training

It is important that the level of environmental awareness of all personnel as well as for any third party or contractors who are hired to perform functions at the borrow pit is enhanced through an environmental awareness compliance workshop on the provisions of the EMP. Some of the topics which could be discussed are:

- Familiarity with all legislation and guidelines relevant to the quarrying operation.
- Discussions of the potential environmental impacts of the quarrying activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities including emergency response preparedness.
- Waste management, handling and disposal.

2.5 Monitoring and Reporting

It is essential to assess the effectiveness of the recommended management strategies through monitoring and keeping of records of specific outcomes and then comparing such outcomes to the benchmarks established in the EIA scoping report. Should corrective action be required, it needs to be documented to reflect not only the corrections that were made, but also preventative measures considered to avoid future recurrence. This should be followed up on, in all future monitoring initiatives to ensure the effectiveness.

In addition to keeping records of monitoring actions and outcomes, the implementation should be internally audited on an annual basis after which the EMP document should be updated or revised (as required) to address the issues and mitigation measures identified during such an audit.

During such annual audit, the appropriateness of the EMP to current activities, monitoring studies and legislation should also be reviewed. This will enhance the relevance of the EMP and verify compliance and progress towards the desired outcomes.

2.6 Reviews

The EMP should be regularly reviewed in order to assess its effectiveness against the overall objectives of gravel mining. The review could be triggered due to the following:

- Changing environmental requirements.
- Change in the activities or operations associated with the borrow pit.
- Deficiencies being identified.
- Results from monitoring actions appearing different from anticipated norms.
- Change in gravel mining technologies or improvements in knowledge.
- Complains from stakeholders

2.7 Environmental Emergencies, Incidents and Accidents

RD37 Management should compile and maintain an environmental emergency producer to respondent to unexpected incidents or accidents that may arise.

While all due care is taken with gravel mining, there will still be potential for unforeseen incidents which could detrimentally affect the receiving environment. The effective management of incidents and emergencies is often achieved through a combination of proactive and reactive measures being implemented. The main purpose for these measures is to:

- Ensure that appropriate procedures are in place to allow a timely response to incidents.
- Ensure that if an incident does occur, that such an incident does not present a threat to the quarry employees, to the wide community and to the environment.
- Ensure the safe movement of all personnel who may be involved in an incident or accident.
- Minimise the environmental damage.
- Minimise potential damage to the assets of the company and its corporate reputation.

3. PRESENTATION OF THE EMP

The EMP is presented in a table format with these headings: potential impacts, environmental objectives, environmental aspects, management actions/measures, timing and the party responsible. Where the party responsible for compliance has not been expressly indicated, the promotor or its appointed Quarry Manager will be responsible.

- EMP for the Planning Stage/Phase
- EMP on Gravel Mining
- EMP on the Maintenance of Support Infrastructure
- EMP on Generic Environmental Mitigation Measures
- EMP on Socio-economic Environment
- EMP on Rehabilitation and Decommissioning

3.1 EMP for the Planning Stage

There are no environmental impacts associated with this phase of the operation. However, the applicant is expected to comply with statutory requirements pertaining to its sphere of operation. The aspects proposed from an environmental perspective under this EMP are related to compliance, communication and handling of complaints. The Borrow Pit Manager is the party responsible for all aspects related to this section.

Table 2: EMP with Respect to Statutory Requirements

Aspects	Management Actions/Mitigation Measures	
Compliance	<ul style="list-style-type: none"> • A valid ECC must be kept at the site at all times and produced to statutory agencies when requested. • Water that may be required for the operation must be obtained in a lawful manner. • Fuel (in bulk) that may be required must be obtained, stored and handled as provided for in the Petroleum Products Act. • A Waste Water Disposal Permit must be obtained to dispose of any rainwater that may collect in the borrow pit. • Should grid electricity be required, procurement must be lawful with connections made by qualified service providers. • Comply with reporting requirements for all permits/licenses including the ECC. 	
Communication	<ul style="list-style-type: none"> • All correspondence relating to gravel mining between third parties must be in writing with copies kept at the office. • The contact details of the key service providers such local police, ambulance, hospital, fire brigade should be readily available in case of emergencies. • Any subcontractor or third party who may be hired to provide any services at the borrow pit must be inducted on the EMP. • The promotor and ECO must be immediately informed should an environmental issue arises at the borrow pit. 	
Complaints	<ul style="list-style-type: none"> • Any complaint lodged regarding any aspect of gravel mining must be recorded, promptly investigated and corrective measures taken. • Allow opportunities for IAPs to continue raising concerns (complainants) about any aspect of the gravel mining that may be affecting them. 	
	Timing	Party Responsible
	Compliance – all the time Communication – throughout the gravel mining operation Complaint – whenever a complaint has been received	RD37 Management

3.2 EMP on Gravel Mining

Gravel mining Extraction is to be confined to extraction areas that are clearly demarcated within the borrow pit. No mining should be conducted within 100 m of any dry river channel on the property. Mitigation measures have been provided with respect to handling of topsoil, refueling of heavy earthmoving machinery, road traffic regulations and safety measures:

Table 3: EMP for Gravel Mining

Environmental Impacts:	
Amongst the potential impacts associated with gravel mining are:	
<ul style="list-style-type: none"> • Habitat destruction • Soil erosion and sedimentation • Noise pollution • Gaseous emissions • Dust pollution • Landscape and visual intrusion, etc. 	
Environmental Objective:	
Protect amenity values and ensure that minimal impacts result from gravel mining conducted on the borrow pit.	
Aspects	Management Actions/Mitigation Measures
Demarcation of the borrow pit	<ul style="list-style-type: none"> • A layout of the borrow pit must be prepared guided by a geotechnical assessment report of the extent of the confirmed gravel resources. • Areas to be excavated for gravel must be clearly identified, demarcated and preferably marked with visible devices, i.e. painted poles. • The markings identifying gravel areas should be maintained throughout the period when such mining areas are being mined. • Site gravel mining areas away from any visible water streams and any sensitive areas.
Gravel Mining	<ul style="list-style-type: none"> • Before any gravel mining starts, a mining plan should be developed, indicating estimated volumes of topsoil, G7 gravel materials available, access to such area, etc. • Areas where topsoil is to be stockpiled should be identified at this stage. • Select gravel mining sites within the borrow pit area that require minimal clearing of vegetation, plants and trees. • Avoid any mature trees or trees with conservation status that are located within a gravel mining area, alternatively obtain written permission to remove such tree(s). • Mining of gravel must only take place within the confines of identified gravel area in the borrow pit. • Where the bedrock is relatively shallow, a layer of gravel of not less than 0.3 m thick should remain on the bedrock to facilitate easier rehabilitation.
Handling of topsoil	<ul style="list-style-type: none"> • Topsoil from the natural ground level down to a depth of 0.3 m must be removed from all areas where physical disturbances of soil surface will occur. • All topsoil removed, must be kept on stockpiles with heights not exceeding 2 m. • Topsoil stockpiles should be made on the high ground side of the mining area within the demarcated borrow pit. • Topsoil should be preserved for future rehabilitation of the mined out areas and must not be used for the maintenance of access roads. • Vegetation regrowth should be allowed on the stockpiles. • Ensure that topsoil on stockpiles does not get contaminated by non-indigenous, alien vegetation and plants.

Onsite fuel storage and handling	<ul style="list-style-type: none"> No bulk fuel may not be stored on the borrow pit unless a Consumer Installation Licence is granted by MIME and this EMP amended to allow for the installation of an aboveground fuel storage tank. Refueling of heavy earthmoving machinery (hydraulic excavator, bulldozer or grader) that may be stationed at the borrow pit must be done by means of a suitable licensed mobile fuel bowser. Small quantities of diesel (less than 200 liters) may be stored & transported in an approved containers such as jerry canners. Drip trays must be used when refueling or when attending to breakdowns of earthmoving machinery stationed at the borrow pit. Any fuel spill from refueling or machine repairs must be immediately contained and cleaned up by scooping out the entire fuel soaked soil and placing such materials in a leak-proof container for disposal in a responsible manner and at a designated approved site. 	
Road Regulations & Traffic impacts	<ul style="list-style-type: none"> Consult the Roads Authority to have traffic signs installation along the B1 highway to warn road users approaching the intersection of the access road to the borrow pit of construction vehicles entering and exiting the B1 highway Traffic signs should be in placed on both directions at least 120 meters before the intersection of the borrow pit access road and B1 highway. Install a stop sign at the intersection of the access road and the B1 road to inform vehicles approaching the highway to stop. Tipper trucks hauling G7 materials must not be overloaded to damage national roads. Trucks hauling gravel must adhere to the mandatory speed limit on public roads (i.e. 80 km per hour). All the Road Authority road restrictions should be complied with at all times. Tipper trucks operated on public roads rucks must be licensed and roadworthy at all times. Since the gravel is fairly damp, there is no need to cover tipper trucks with tarpaulin. Tipper trucks must have their headlights switched on at all times as well as fitted with flashing amber lights on the cab roof to warn other road users. Trucks must be operated by drivers who are fit, well trained and experienced. Over-speeding is not allowed. Drivers should be on the lookout for people on the roads, wild animals, domestic animals, and any other obstacles such as fallen trees on the road. 	
Safety measures around the work areas	<ul style="list-style-type: none"> No employee is allowed to enter the borrow pit while under the influence of alcohol (intoxicated.) No person may enter an area marked as a 'No-Go' area without permission. Visitors entering the borrow pit must be given a short induction on the EMP. No employee is allowed to perform any activity which requires the use of PPEs unless provided with suitable PPEs. 	
	Timing	Party Responsible
	Demarcation – before mining starts Topsoil – before starting with mining operation and throughout Traffic & Safety – ongoing throughout the operation lifespan	RD37 Management

3.3 EMP on the Maintenance of Support infrastructure

The gravel mining operation is conducted with minimal support infrastructure having been erected on the premises – this is due to the fact that the operation is quite small and conducted intermittently, i.e. whenever there is a need for backfilling or road construction gravel materials. Management measures have been provided in Table 4.

Table 4: EMP on the Maintenance of Support Infrastructure

Potential Impacts: <ul style="list-style-type: none"> • Dust from the access road • Accidents or incidents due to a poorly maintained access road • Visual nuisance from the motorists using the adjacent highway 							
Environmental Objectives: Protect amenity values by ensuring that all support infrastructure are well maintained.							
Aspects	Management And Mitigation Measures						
Maintenance of Access Roads and Internal Routes	<ul style="list-style-type: none"> • The access road to the borrow pit should be well maintained and kept spill-free at all times. • A well maintained access road has these potential benefits: <ul style="list-style-type: none"> ○ It minimises dust generation; ○ It eliminates incidents and accidents, and ○ It avoids truck & vehicle breakdowns and costly repairs. • Off-road driving must be prohibited. • Operators must comply with speed limits on the access road and on any other borrow pit internal routes. 						
Cleaning drinking water	<ul style="list-style-type: none"> • Provide clean drinking water at the borrow pit for personnel – minimum 100 liters per day. • Potable water must be procured in a lawful manner. 						
Sanitation	<ul style="list-style-type: none"> • Provide one potable chemical toilet at the borrow pit. • Provide toilet paper and clean water to wash hands after using the toilet. • Locate the chemical toilet away from any sensitive areas – minimum distance 50 m away. • Under no circumstances should employees use bushes & plants as toilet facilities. • The chemical toilet must be well maintained with its content frequently emptied by a competent party. 						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #fff2cc;">Timing</th> <th style="background-color: #fff2cc;">Party Responsible</th> </tr> </thead> <tbody> <tr> <td style="background-color: #fff2cc;">Maintenance - through the gravel mining lifespan</td> <td rowspan="3" style="background-color: #fff2cc; vertical-align: top;">RD37 Management & ECO</td> </tr> <tr> <td style="background-color: #fff2cc;">Drinking water - daily</td> </tr> <tr> <td style="background-color: #fff2cc;">Sanitation - weekly</td> </tr> </tbody> </table>	Timing	Party Responsible	Maintenance - through the gravel mining lifespan	RD37 Management & ECO	Drinking water - daily	Sanitation - weekly
Timing	Party Responsible						
Maintenance - through the gravel mining lifespan	RD37 Management & ECO						
Drinking water - daily							
Sanitation - weekly							

3.4 EMP on socio-economic environment

Gravel mining from the borrow pit on Portion 111 has been ongoing for a number of years, and as such minimal direct socio-economic impacts in the form of employment opportunities is not expected. The management measures provided under this section has been made on the assumption that new economic opportunities may arise:

Table 5: EMP on Socio-economic Environment

<p>Potential Impacts:</p> <p>Based on the aforesaid paragraph, minimal impacts are expected:</p>	
<p>Environmental Objective :</p> <p>Optimize benefits to the local community by striving to become a responsible and caring corporate citizen, contributing to the social welfare and upliftment of the surrounding communities.</p>	
Aspects	Management Measures /Mitigation
Enhance positive Economic Impacts:	<ul style="list-style-type: none"> • Source and procure goods required for the quarrying operation from local suppliers: spare parts, fuel, oil lubricants, etc. • Make use of local small-scale contractors for activities such security at the quarrying site, vegetation clearing, cleaning, etc. who are experienced and with good references.
Recruitment Process or Hiring of Employees	<ul style="list-style-type: none"> • Offer employment in compliance with applicable labour laws and regulations. • Adopt a 'local first policy' when hiring workers for non-skilled positions by giving preference to the village residents. • Hire without discrimination on the basis of gender, race, language, background, religion or political affiliations.
Labour & Working Conditions	<ul style="list-style-type: none"> • Conditions of employment should be in writing with a copy kept on file and one copy given to employees. The contract must state job specifications, working hours, remuneration, etc. • Give all employees an induction on the EMP, housekeeping rules including safety, grievances procedures and company policies. • Keep proper records on the number of employees, fulltime/part-time, contractors hired, payments made to contractors, salaries/wages, etc.
Employees' Wellbeing	<ul style="list-style-type: none"> • Develop a policy on social ills to deal with aspects related to drugs, excessive alcohol consumption, unsafe sex practices, HIV/AIDS, etc. • Provide on-the-job training opportunities to help employees to improve their skills level which ultimately leads to high productivity and reduced wastage.

3.5 EMP for the Generic Environmental Management Impacts

The following environmental aspects have been treated as generic and mitigation measure accordingly recommended:

- Dust & Gaseous Emissions
- Noise Pollution
- Waste Handling and Disposal
- Open Fire and Fire Prevention
- Biodiversity
- Landscape and Aesthetics
- Heritage and Cultural Remains

Table 6: EMP for the Generic Environmental Mitigation Measures

Potential Impacts:		
A number of adverse impacts can be expected and management measures have been provided:		
Environmental Objectives:		
Ensure the recommended management measures are implemented and that gravel mining does not result in adverse impacts to the environment.		
Aspects	Management Measures / Actions	
Atmospheric Impacts – Dust and Gaseous Emissions	<ul style="list-style-type: none"> • Machinery, tipper trucks and LDVs used in the operation must be well maintained, regularly serviced and idling times limited so as to minimize gaseous emissions into the atmosphere. Where possible, fuel with low sulphur content (diesel with 50 ppm) should be used. • Where possible material stockpiles should be located in sheltered areas where they are not exposed to erosive effects of the wind. Where erosion of stockpiles becomes a problem, erosion control measures must be implemented. This could include reducing the height and size of the stockpile or positioning the stockpiles in areas where they are not exposed to wind erosion. • A speed of not more than 30 km/hour must be maintained and enforced on the access road and all borrow pit internal routes. Speed limit signage must be prominently displayed along such routes. • Employees working in areas where gaseous emissions are generated should be provided with suitable PPE. • Any complaints or claims emanating from lack of dust control should immediately be investigated and corrective action taken 	
	Monitoring Frequency	Responsible Party
	Monitor quarterly. In the event of a complaint related to dust or gaseous	RD37 Management
Noise Pollution	<ul style="list-style-type: none"> • Ensure that machinery and equipment used in the operation are well maintained and routinely serviced with any defective silencers replaced. • Machinery and equipment that are used intermittently (excavators when waiting for tipper trucks to return to borrow pit) must be shut down between work periods or throttled down to a minimum and not left running unnecessarily. This practice will reduce noise and at the same time conserve fuel. • Confine gravel mining in the borrow pit to working hours between 07h00 and 17h00. • No work may be performed on Sunday or public holiday unless permission has been granted by the line ministry. • Limit any non-routine noisy generating activities such as maintenance or servicing of plants and equipment to day-time hours. • Train operators of tipper trucks to position the trucks to the excavators for loading without reversing in order to avoid the activation of disturbing, but necessary reverse warning sound. 	
	Monitoring Frequency	Party Responsible
	Monitor quarterly and report annually. In the event of a complaint received, an investigation should be launched immediately and corrective action taken.	RD37 Management
<u>Non-hazardous waste</u>		

Waste Handling and Disposal	<ul style="list-style-type: none"> • Develop an in-house waste handling policy for the borrow pit which includes keeping various types of waste separate. • Non-biodegradable and recyclable waste (plastics, cans, bottles, packaging materials, metal scraps, etc.) should be stored separately and disposed of on a regular basis to the waste facility of TM. • Organic waste (food items, potatoes skins, etc.) should be stored in a bin with secure lids and not fed to wild animals. • Avoid wind dispersal of papers and plastics as it results in visual nuisance. Plastics can be fatal to animals when confused. • Maintain a high standard of housekeeping. <p><u>Hazardous waste</u></p> <ul style="list-style-type: none"> • Develop and implement a hazardous waste management plan for the operation. • Ensure that training on the handling and management of hazardous waste is given to all personnel. • Any fuel spill that occurs should be contained and immediately cleaned up by scooping out the entire fuel/oil soaked soil and storing in a leak-proof container for disposal at an approved landfill facility. • Used oil, fuel filters, fuel soaked soil, oil rags, etc. are hazardous waste and should be placed in a leak-proof container for disposal in a responsible manner at an approved offsite landfill facility. • Fuel and refuelling should be handled by properly trained personnel. • A fuel spill in excess of 200 litres is reportable incident that should be promptly reported to the line ministry including steps taken to prevent re-occurrence. • Under no circumstance should hazardous waste be buried on the borrow pit premises. 	
	<p>Monitoring Frequency</p> <p>Depending on the volume involved, non-hazardous waste should be removed from the site at least weekly.</p> <p>Hazardous waste should be removed immediately (on the date of occurrence)</p> <p>The effectiveness of the waste management plan must be assessed annually.</p>	<p>Responsible Party</p> <p>DR37 Management & ECO</p>
Contamination of Surface and Groundwater Sources	<ul style="list-style-type: none"> • Ensure that no gravel mining takes place on the borrow pit during the rainy season. • Develop a storm water management plan which provides for clean and dirty water not to mix. • Develop suitable erosion protection measures around those areas of the borrow pit that appear prone and susceptible to erosion. • Ensure that mining areas impacted by erosion are restored by rehabilitation. • Spill kits must be provided and carried by the personnel conducting refuelling in the borrow pit. Operators should be regularly debriefed on the use of, and safe handling of spill kits. • No gravel mining may take place in any area identified as “No-Go” areas, which should be cordoned off during mining operations. 	

	<ul style="list-style-type: none"> Prevent or minimise potential pollution of surface water as a result of insufficient and poor maintenance of the chemical toilet on the premises. Any rainwater collected in the borrow pit must not be discharged in the natural environment, but in a separate pond superficially made for that purpose. A Waste Water Disposal Permit may be required. Dewatering of the borrow pit should be done through non-intrusive methods such as pumping wastewater by means of a flexi hosepipe. 				
	<table border="1"> <thead> <tr> <th>Monitoring Frequency</th> <th>Responsible Party</th> </tr> </thead> <tbody> <tr> <td>Check erosion prone before and immediately after the rainy season. Effect any repairs after the rainy season</td> <td>RD37 Management</td> </tr> </tbody> </table>	Monitoring Frequency	Responsible Party	Check erosion prone before and immediately after the rainy season. Effect any repairs after the rainy season	RD37 Management
	Monitoring Frequency	Responsible Party			
Check erosion prone before and immediately after the rainy season. Effect any repairs after the rainy season	RD37 Management				
Open Fire and Fire Prevention	<ul style="list-style-type: none"> Avoid making open fire on the borrow pit premises, alternatively fire should be made at a dedicated area and under direct and constant supervision at all times. Should welding be performed on the borrow pit, suitable fire-fighting equipment should be provided. No smoking is allowed in areas where there is a fire hazard, i.e. near refuelling or fuel storage area. Fire emergency procedures should be established for the gravel mining operation. If firewood is used for cooking purposes, i.e. to make coffee during lunch, a fire-break should be cleared around the lunch designated area. No trees should be felled or wilfully damaged for purposes of obtaining firewood. 				
	<table border="1"> <thead> <tr> <th>Monitoring Frequency</th> <th>Responsible Party</th> </tr> </thead> <tbody> <tr> <td>Ongoing throughout the gravel mining operation</td> <td>RD37 Management</td> </tr> </tbody> </table>	Monitoring Frequency	Responsible Party	Ongoing throughout the gravel mining operation	RD37 Management
	Monitoring Frequency	Responsible Party			
Ongoing throughout the gravel mining operation	RD37 Management				
Preserving and Protecting Biodiversity	<p>EMP Induction</p> <ul style="list-style-type: none"> Conduct an environmental induction specifically dealing with aspects related to the biodiversity (flora and fauna) and the importance thereof to all personnel. Keep records of all personnel induced on the EMP <p>New Borrow Pit & New Access Routes</p> <ul style="list-style-type: none"> All new Borrow Pits must be well planned and clearly demarcated so as to minimise vegetation and plant clearance. Avoid sensitive areas, i.e. breeding areas, etc. when selecting new Borrow Pits. Make use of existing routes within the borrow pit area to access any new borrow pit that are made. Rehabilitate old borrow pits before moving on to a new a borrow pit. Discourage off-road driving and reprimand drivers found driving off-road. When making new routes, select the route that leads to minimal vegetation clearance & disturbance. <p>Vegetation</p> <ul style="list-style-type: none"> Allow vegetation to grow on borrow pit slopes and put storm water management in place to limit the potential of soil erosion. 				

	<ul style="list-style-type: none"> • Big trees and any trees in which birds are nestling should be avoided and left undisturbed when stripping the topsoil to expose the weathered gravel materials underneath. <p>Poaching of Livestock & Wildlife</p> <ul style="list-style-type: none"> • Dogs and cats are prohibited on the borrow pit or on the farmland where the borrow pit is located unless permitted by the landowner. • No handguns are permitted. • No snares or trap wire devices may be used to catch wildlife. • Employees must report any suspicious movements observed on the farm to their Supervisor. • Poaching is a criminal activity and, if caught, perpetrators can get long jail terms. 							
	<table border="1"> <thead> <tr> <th>Monitoring</th> <th>Party Responsible</th> </tr> </thead> <tbody> <tr> <td>Induction – beginning of the employment</td> <td rowspan="4">DR37 Management</td> </tr> <tr> <td>New mining areas – before moving to such new areas</td> </tr> <tr> <td>Rehabilitation – before moving to new mining areas</td> </tr> <tr> <td>Poaching - Throughout the gravel mining operation</td> </tr> </tbody> </table>	Monitoring	Party Responsible	Induction – beginning of the employment	DR37 Management	New mining areas – before moving to such new areas	Rehabilitation – before moving to new mining areas	Poaching - Throughout the gravel mining operation
	Monitoring	Party Responsible						
	Induction – beginning of the employment	DR37 Management						
New mining areas – before moving to such new areas								
Rehabilitation – before moving to new mining areas								
Poaching - Throughout the gravel mining operation								
<p>Landscaping and Aesthetics</p> <ul style="list-style-type: none"> • Locate and site any infrastructure away from sensitive and elevated areas. • Place topsoil or any overburden stockpiles on the lowest section of the borrow pit to reduce visual impacts by the public using the adjacent highway. • Keep stockpiles of materials as low as possible in order to reduce visual nuisance and possible wind erosion. • Spraying stockpiles with minimal water can prevent dust escaping from stockpiles into the atmosphere becoming a visual annoyance to the public using adjacent highways. • Windblown papers and plastics around the borrow pit should be regularly picked up to avoid visual nuisance. • Keep the chemical toilet clean and tied to avoid odour nuisance. 								
<table border="1"> <thead> <tr> <th>Monitoring</th> <th>Party Responsible</th> </tr> </thead> <tbody> <tr> <td>Throughout the gravel mining operation</td> <td>DR37 Management</td> </tr> </tbody> </table>	Monitoring	Party Responsible	Throughout the gravel mining operation	DR37 Management				
Monitoring	Party Responsible							
Throughout the gravel mining operation	DR37 Management							
<p>Cultural and Heritage Resources</p> <p>Chance Find:</p> <p>Train personnel involved in the gravel mining operations on the 'chance find' procedure to be followed from the discovery of a heritage site or item, to the necessary investigation and subsequent assessment by an archaeologist or any other qualified person</p> <p>Action by the individual who discovers an archaeological site or item:</p> <ul style="list-style-type: none"> • If operating a machine, stop work immediately. • Mark the site with flag tapes. • Determine GPS reading if possible. • Report findings to immediate Mining Supervisor. <p>Action by the Supervisor/Foreman</p>								

	<ul style="list-style-type: none"> • Visit the site and ascertain if mining work can continue without any damage to the item unearthed. • Determine and mark exclusion to boundary. • Site location and details to be added to the project GIS for field confirmation by an archaeologist or qualified person. <p>Action by Borrow Pit Manager:</p> <ul style="list-style-type: none"> • Inspect site and invite officials from NHC to visit the site. • Confirm addition of the item to project GIS. • Accompany NHC to the site • Obtain written permission to remove findings from the working area. <p>If discovery is human remains proceed as follows:</p> <ul style="list-style-type: none"> • Actions as above. • Report find to the nearest Namibian Police. • Report to NHC in Windhoek and invite them to the site. • Field inspections by archaeologist to confirm that remain is human. • Advise and liaise with NHC and NamPol on removal. 	
	Monitoring/Reporting	Party Responsible
	Whenever a discovery has been made	As indicated otherwise, RD37 has the overall responsibility

3.6 Decommissioning and Rehabilitation Guidance

It is advisable to have a decommissioning plan developed at the early stages of the project and funds set aside for the implementation of the plan. It is also crucial for the decommissioning plan to make provision for mining operation having to cease due to the unfavourable circumstances, i.e. economic factors (recession), complete collapse of the construction industry, etc. In the Table 7 below, guidelines have been provided on decommissioning of the proposed mining operation. It is recommended that the information provided here be used by the proponent as basis to plan.

Table 7: Decommissioning and Rehabilitation

Aspect	Management Measures/actions
Decommissioning Plan	<ul style="list-style-type: none"> • Develop a decommissioning plan during the planning stage of the operation and start allocating funds to a decommissioning budget. • Review the decommissioning plan at least annually. • Prior to decommissioning, inform all stakeholders and IAPs making them aware of the intended plan to cease gravel mining operations.
Rehabilitation of the Borrow Pits	<ul style="list-style-type: none"> • Mined out gravel areas must be rehabilitated by backfilling with any remaining oversized boulders. • The topsoil stored elsewhere should be backfilled last over the mined out area and vegetation regrowth monitored over a time period.

Aspect	Management Measures/actions	
	<ul style="list-style-type: none"> • If reasonable assessment indicates that re-establishment of vegetation is relatively poor, the soil can be analysed and any deleterious effect on the soil arising from mining activities corrected. • No waste should be dumped into mined out area to be covered during the rehabilitation • Complete backfilling of the borrow pit may not be undertaken if the material required for complete backfilling is unavailable or the procurement of such materials will cause undesirable environmental impacts. • The potential to use the gravel pit(s) as future should be explored – an earth dam to capture rainwater or a landfill site for use by TM. 	
Dismantling of Fixed Structures	<ul style="list-style-type: none"> • Dismantle any fixed infrastructure from the borrow pit premises and offer for sale to scrap dealers and or to recycling companies • All disturbed footprint areas must be graded and re-countered to match the surrounding landscape. The surface should be ripped and covered with topsoil in order to allow water infiltration and re-vegetation. • Rehabilitation of the access road must be done in the event that the access road will not be required for farming operations in the future. • Dismantle and remove the chemical toilet provided on the premises. 	
Post Closure Rehabilitation Monitoring	<p>It is recommended that monitoring post-closure-rehabilitation be focused on four key areas over a period of at least two years:</p> <ul style="list-style-type: none"> • Vegetation regrowth monitoring • Erosion monitoring and management • Surface run-off monitoring • Management and monitoring of pollution control 	
	Timing	Party Responsible
	Throughout the gravel mining operation	RD37 Management

4. CONCLUSION AND RECOMMENDATION

Although every attempt has been made to address all possible potential mitigation measures in this document, the EMP should be considered as a day-to-day management tool, which sets out the minimum environmental and social standards that are required, to minimise adverse impacts and maximize the positive benefits of the gravel mining operation.

Apart from legal compliance, adherence to the recommendations in this amended EMP will result in a well-managed gravel mining operation, which in turn will minimise operational costs, and potential negative environmental impacts.

Overall, the EMP should be reviewed on an on-going basis and any changes or amendments made communicated to the OEC at MEFT. Based on the observations made during site inspection, it is incumbent upon the proponent, to make a careful assessment of whether any modifications to the mitigation measures, as proposed in this EMP may be required, in order to improve the overall efficiency and applicability of the EMP to the prevailing gravel mining operation.

Ekwao Consulting is confident that the management measures outlined in this EMP are adequate to mitigate the impacts and threats to the environment and the general public.

It is recommended that the ECC application of Rainy Day Investments 37 (Pty) Ltd be granted.