APPLICATION NO: 250818006254

RENEWAL of Sand Mining Environmental Clearance Certificate For Eenhana Town Council In Eenhana Townland, Ohangwena Region

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ABBREVIATIONS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
ETC	Eenhana Town Council
MET	Ministry of Environment and Tourism
RD	Red-Dune Consulting CC
SM	Site Manager
TA	Traditional Authority

I. EXECUTIVE SUMMARY

(a) Introduction

Red-Dune Consulting conducted an environmental audit of Eenhana Town Council's sand-mining operation on 25 July 2025 to assess compliance with the approved Environmental Management Plan (EMP), applicable Environmental Clearance Certificate (ECC) conditions and relevant legislation, and to evaluate the site's environmental performance.

(b) Scope and approach

The audit covered the active extraction area (~0.28 ha) and supporting infrastructure, document review, site inspection, staff interviews and a review of monitoring and record keeping. Key focus areas included site security, extraction practices, erosion and dust control, safety around excavations, rehabilitation progress, and evidence of environmental monitoring.

(c) Key findings

- **Compliance:** Operations observed were generally consistent with the EMP and ECC requirements. No material instances of non-compliance were identified during the audit.
- **Site condition:** The site has been cleared and excavated to depths of approximately 3–4 m. Perimeter fencing and access controls are in place and monitored. No active extraction occurred during the visit.
- **Environmental risks:** The loose sandy substrate and excavation depths increase risks of windblown dust, erosion and gully formation and pit instability.
- **Management systems:** Procedures, security measures and operational controls are in place; however, recordkeeping, routine environmental monitoring and progressive rehabilitation require strengthening.

(d) Conclusions

The sand-mining operation is being managed responsibly within the scope observed, and the EMP is being implemented in practice. Nevertheless, the scale and depth of excavations in a loose sandy environment create foreseeable environmental and safety risks that must be carefully managed.

(e) Priority recommendations

1. Stabilise and rehabilitate exposed areas progressively; regrade slopes to 1:3 and commence revegetation.
2. Maintain and enhance safety measures around excavations (fencing, signage, barriers).
3. Implement dust suppression on haul roads and working faces and enforce vehicle speed limits.
4. Improve recordkeeping and reporting (extraction volumes, monitoring data, incident logs) and submit regular compliance reports to the ministry.
5. Red-Dune Consulting recommends to the Ministry for the renewal of ECC.

Chapter 1. INTRODUCTION AND BACKGROUND

1.1. Proponent

Eenhana Town Council (ETC) is the proponent for this application. The town was proclaimed a settlement in 1992, and a town in 1999.

1.2. Sand mining

Building sand is essential for the construction of many types of infrastructure, including brick houses and commercial buildings. Sand extraction supports numerous developments that create employment and stimulate economic growth; consequently, sand mining is inevitable.

However, if sand is not acquired and managed properly, it can cause severe land degradation. Namibia faces significant challenges from sand mining, particularly in northern communal areas.

There have been reports of human and animal fatalities due to falls and drownings in illegal sand-mining pits, extensive land degradation that threatens national infrastructure such as roads, and cases where mining has prevented people from accessing their homesteads.

1.3. Statutory Requirement

The Environmental Management Act, 2007 (Act No. 7 of 2007) (EMA) was enacted in 2007 and came into force on 6 February 2012. Part VII, Section 27 of the EMA lists activities that may not be undertaken without an Environmental Clearance Certificate (ECC); sand mining is among these listed activities. Section 31(1) provides that, “Despite any other law to the contrary, a competent authority may not issue an authorisation unless the proponent has obtained an environmental clearance certificate in terms of this Act.”

Consequently, the EMA makes it unlawful for anyone to undertake sand mining without a valid ECC. For these reasons, sand mining must be carried out in a controlled, legally regulated manner to protect public safety, livelihoods and the environment.

1.3.1. Statutory Compliance

On 15 July 2019, ETC submitted an Environmental Impact Assessment (EIA) and an Environmental Management Plan (EMP) as part of its application for ECC for sand mining. An ECC was issued on 19 September 2019. Under the Environmental Management Act (EMA), an ECC is valid for three years and may be renewed in accordance with Section 56 of the EMA; the ECC for this operation therefore expired on 19 September 2022. This updated EMP has been prepared to support the application for ECC renewal.

1.4. Location

The sand mining is taking place on 4-hectare (Figure 1) piece of land, on the periphery of the main Oshigambo-Eenhana tarred road (GPS Coordinates -17.512083° E, 16.331572° S).

(Google image 18 August 2025) **(Google image 16 June 2019)**

Figure 1. Eenhana Town Council Sand Mining Site: Two images showing before and after sand mining

1.5. Scope of project

The purpose of this project is to assess the environmental performance of the Eenhana Town Council's (ETC) sand-mining operation in support of the application to renew the Environmental Clearance Certificate (ECC). The scope focuses on determining whether site operations comply with the existing Environmental Management Plan (EMP), applicable conditions of the ECC and relevant provisions of the Environmental Management Act (EMA), and on identifying any gaps or risks that require corrective action prior to ECC renewal.

1.5.1. Specific objectives

- **Verify implementation**: Assess the extent to which the mitigation measures and management actions set out in the current EMP have been implemented on site.

- **Evaluate compliance**: Determine compliance with ECC conditions, EMA requirements and other applicable legislation or permits.
- **Identify gaps and risks:** Identify non-conformances, potential environmental liabilities and operational weaknesses that could compromise environmental performance or regulatory compliance.
- **Recommend corrective actions:** Provide practical, prioritized recommendations to address identified deficiencies and to strengthen monitoring, management and reporting ahead of ECC renewal.
- **Inform stakeholders:** Produce an evidence-based audit report to support ETC's ECC renewal application.

Chapter 2. ENVIRONMENTAL AUDIT

2.1. Audit approach and methodology

The environmental audit was undertaken using the existing EMP as the primary benchmark for implementation performance, and included the following components:

- **Document review:** Examination of the current EMP, the original EIA/ECC documentation, monitoring records, incident registers, training and induction records, waste disposal receipts, maintenance logs and any previous audit or compliance reports.
- **Site inspections:** Site visits to inspect active extraction areas, access routes and haul roads, stockpiles, rehabilitation areas, and support facilities. Photographic evidence and field notes were recorded.
- **Interviews and consultations:** Structured interviews with site management, to verify procedures and gather observations about operational practices and impacts.
- **Compliance checklist:** Systematic assessment of on-the-ground conditions against EMP commitments, ECC conditions and statutory requirements using a checklist.
- **Reporting:** Preparation of an audit report that documents findings, assesses significance of non-conformances, and provides recommended corrective and preventive measures, timelines and responsible parties.

2.2. Scope Limitation

The audit focused on sand-mining activities and direct support infrastructure located within the mining area, including extraction pits, stockpiles, access/haul roads and perimeter fencing. It did not extend to off-site impacts nor did it include detailed, noise, dust, and hydrogeological investigations.

2.3. The Audit

On 25 July 2025, Red-Dune Consulting conducted a comprehensive environmental audit of the sand-mining operations at the ETC site under the above mentioned scope. The site condition were as follows:

- **Extent of disturbance:** The site has been cleared and excavated over an area of approximately 0.28 hectares. Excavations reach depths of about 3–4 metres (see Figure 2).

- **Geology and terrain:** Eenhana Town lies within the northeastern Kalahari Woodland, a landscape characterized by deep, loose sands. The audit observed that the mining area reflects these natural sandy conditions, which influence erosion risk and groundwater recharge characteristics.
- **Security and access control:** The site perimeter is fenced and access is restricted to authorised personnel. Security personnel monitor the fence to prevent unauthorised entry and to maintain safety protocols.
- **Operational status:** No active extraction was taking place during the visit. ETC officials informed the audit that extraction activities at the site normally employ heavy machinery such as excavators, front-end loaders and tipper trucks.
- **Compliance:** Based on documentary review and the site inspection, operations observed were within the boundaries and requirements set out in the EMP. No instances of material non-compliance with environmental regulations or EMP commitments were identified during this audit.

Entrance with Locked Gate

Perimeter Fence

Sand Mining Area / Footpring

Security Room

Figure 2. Environmental Audit for ETC Sand Mining Site (25 July 2025)

Non-Compliance

- **EMP Awareness:** Although overall the operation were compliant to the requirements set out in the EMP, there is no evidence of creating awareness of the EMP.
- **Toilets:** There is ablution facilities on site

Chapter 3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The continued operation of sand mining will be subject by the following national and international laws (Table 1).

Table 1. Policy and legal framework governing the project

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
The Namibian Constitution	The State shall actively promote and maintain the welfare of the people by adopting policies aimed at … The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future	Protection of the environment and biodiversity
Environmental Management Act No. 7 of 2007	This act aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters	The acts provides a list of activities that may not be undertake without an environmental clearance certificate to prevent environmental damages
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management	To protect the Environment from possible hydrocarbons and oil leaks from the machinery and vehicles

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
Environmental Policy framework (1995)	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment.	Consideration of all possible impacts and incorporate them in the development stages
The Occupational Safety and Health Act No. 11 of 2000	Promotes the Safety and Health of employees at the work place	Employees subjected to noise and dust
Public and Environmental Health Act, 1 of 2015.	Provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	Application of proper mitigation measure to noise and dust
Labour Act No. 11 of 2007	This Act outlines the labour laws which encompass protection and safety of employees at work.	This project will require labour during its operational stage and decommissioning stage.
Water Act No, 54 of 1956	All water resources belongs to the State. It prevents pollution and promotes the sustainable utilization of the resource	Hydrocarbons from machinery has the potential to pollute water resource
Soil Conservation Act No. 76 of 1969	To promotes the conservation of soil, prevention of soil erosion	Uncontrolled movement of heavy vehicles and truck at areas surrounding the site may cause land degradation
Water Resource Management Act No.11 of 2011	The Act stipulates the prevention of both Surface and Ground water sources.	Oil spillage coming from machines and transporting vehicles need to be prevented to avoid water contamination.

REGULATORY FRAMEWORK	SUMMARY	APPLICABILITY
Public Health Act no. 36 of 1919	The Act gives provision for the protection for the health of all people.	The noise and dust level emanating from the project could affect the surrounding community.
National Heritage Act No.27 of 2004	The Act gives provision of the protection and conservation of places and objects with heritage significance.	There were no heritage features identified on site or within the close vicinity of the site. A chance find shall be implemented
Local Authority Act No. 23 of 1992 Government Notice of No.116 of 1992.	This Act underlines the duties and functions of the	All stakeholders affected by the operations of the project have been informed of the developments including that of undertaking the EIA.
Traditional Authorities Act, 25 of 2000	Provides for the establishment of traditional authorities and defines their powers, duties and obligations with the governance of the communal land	Traditional Authorities Act, 25 of 2000

Chapter 4. Updated EMP

4.1. Purpose of the EMP

The key objective of this EMP is to ensure that all activities associated with sand mining are carried out in an environmentally sustainable and legally compliant manner. It serves as a comprehensive risk management strategy designed to address and mitigate potential environmental impacts associated with the project.

It provides a clear logical framework that outlines what needs to be done, how it will be monitored, and the steps to reduce potential negative effects on the environment. It ensures that environmental protection is integrated into every phase, operation, closure and decommissioning in alignment with relevant legal and regulatory requirements.

Furthermore, the EMP clearly defines the roles and responsibilities of all stakeholders involved in the project, including the ETC, contractors, and regulatory authorities, to ensure accountability, effective implementation of mitigation measures, and continuous environmental performance improvement.

4.2. Roles and Responsibilities

To promote accountability, effective implementation of mitigation measures, and continuous environmental performance improvement, it is essential to assign clear delegation of roles and responsibilities across all levels of the project. The following outlines the key roles and their associated responsibilities to ensure the successful implementation of the EMP.

Table 2. Roles and Responsibility

Role	Responsibility
Proponent: ETC	1) Overall responsibility for ensuring that the project complies with all environmental legislation and regulations.

	2) Allocate resources and budget for the implementation of the EMP. 3) Appoint an Environmental Control Officer (ECO) to oversee day-to-day environmental management on site. 4) Ensure that the EMP is regularly reviewed and updated to reflect any changes in project scope, legislation, or environmental conditions. 5) Liaise with regulatory authorities and stakeholders to report on environmental performance and address any concerns.
Environmental Compliance Officer (ECO)	1) Monitor and ensure compliance with the EMP, environmental regulations, and site-specific requirements. 2) Conduct regular site inspections to verify the implementation of mitigation measures. 3) Coordinate with project personnel to ensure proper waste management, pollution control, and safety protocols are followed. 4) Prepare regular environmental performance reports, including monitoring results and corrective actions, and submit these reports to the project proponent and relevant authorities. 5) Lead training sessions for project staff on environmental best practices and legal obligations. 6) Act as the primary point of contact for environmental matters and regulatory agencies. 7) Modifying or improving mitigation measures for purposes of corrective action
Site Manager	1) Ensure the project's overall operations are conducted in accordance with the EMP and approved environmental permits. 2) Supervise all exploration activities to ensure they align with environmental guidelines. 3) Work closely with the ECO to implement corrective actions when environmental non-compliance is identified.

	4) Ensure that all personnel are appropriately trained in environmental procedures and that they adhere to the safety protocols established in the EMP.
Contractors and Subcontractors	1) Ensure that all contracted activities comply with the EMP and all applicable environmental regulations. 2) Provide their workers with adequate environmental and safety training. 3) Monitor and report on the environmental performance of their activities. 4) Implement mitigation measures specific to their scope of work as outlined in the EMP and ensure that they are properly maintained.
Ministry of Environment, Forestry and Tourism (MEFT)	1) Review and approve the EMP. 2) Conduct inspections and audits to ensure compliance with environmental laws and regulations. 3) Provide oversight and guidance on environmental compliance.

4.3. The EMP Table

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
A. EMP AWARENESS					
Knowledge and understanding of the EMP	Ensure all are knowledgeable of the EMP	1. Undertake induction meeting with contractors and all stakeholders involved in the sand mining activities	Minutes of the awareness meeting	Site Manager	There are no minutes of induction as indicators for EMP awareness. Furthermore, no sand mining was taking place to interview operators / employees
B. BIO-PHYSCIAL ENVIRONMENT					
Biodiversity	Protection of flora and fauna	1. Big trees within the site should be preserved where possible 2. Tree and bushes that are nesting places for the birds must not be cut down. (This would not be necessary as the area is does not have nesting places) 3. Do not plant alien trees	Visual inspection	Site Manager	Big trees are preserved and looking like they are on an island, but their roots are damaged. Early rehabilitation could save the trees, thus as soon as mining around big trees is done, it is important

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
					for the surrounding areas to be backfilled.
Land Degradation	To prevent land degradation	1. Only drive on designated haul roads 2. Movement of vehicles must be restricted within the site 3. Ensure no gullies are formed during rainfall 4. Refer to the rehabilitation and closure plan for the trimming and shaping of the pits slopes 5. Continuous rehabilitation of the burrow pit must be conducted by proper profiling and smoothing of the slopes to be less than 1 to 3 to improve slope safety by allowing easy access of animals into the pit (after use) and to allow smooth runoff of storm water hence preventing soil erosion.	Visual inspection	Site Manager	There is no sign of land degradation, haul trucks are using one haul road however, continuous rehabilitation is lacking.

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
Top Soil	To conserve of top soil that will be used for revegetation during rehabilitation	1. Preserve the top soil 2. Use vegetation cover to preserve top soil	Visible Stockpile	Site Manager	100% Compliant
C. HEALTH AND SAFETY					
Safety at work place	This section aims to protect the safety of the employees at work place. Adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617)	1. Developer must develop a Health and Safety Plan 2. A compulsory safety induction course must be given to all employees. 3. Adequate safety signs must be put on site. 4. Each employee must be provided with Personal Protective Equipment (PPE) and must be worn all the time during working and when on site.	Company Safety Plan Safety induction minutes Visual inspection PPE available Valid license to operate machinery	Site Manager	There were no workers on site during assessment. ETC however made it a mandatory for workers to have full PPE

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		5. Employees must possess a valid licence to operate heavy machinery 6. Provide a first aid kid to be available onsite at all time 7. No unauthorised fires shall be permitted on site, 8. To avoid field fires, smoking is only permitted at designated sites with low risk to fire; 9. Provide at least one fire extinguisher	First Kid available onsite Visual Inspection Designated smoking place Visual Inspection		
Dust	To protect public health	1. Avoid operation during strong windy times 2. Haul trucks transporting sand must be covered during transportation 3. Use dust suppression measures such as water spraying to mitigate dust impacts. 4. Avoid working during extreme windy times	Public complaint Visual inspection	Site Manager	There hasn't been complaint about dust pollution and this aspect could not be assessed as there was no sand mining activity during assessment

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		5. Avoid unnecessary movement of vehicles on site 6. Keep records of complaints to monitor community dissatisfaction 7. Operation must be limited to day hours only, from 05H00-18H00 8. Adequate safety signs must be put at designated places. 9. Do not operate during windy times 10. During sand transportation, keep the speed limit below 40km/h on all gravel and village roads 11. Transporting trucks must be properly covered 12. Use water spray to supress dust where necessary			
Noise	Reduce noise pollution	1. Avoid unnecessary reeving of engines 2. All vehicles and equipment must be well serviced	Public Complain register	Site Manager	There are no nearby receptor. Noise could nuisance during transportation

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		3. Do not hoot unnecessarily 4. Vehicle engines must be switched off when not in use 5. Only operate during day time (05H00-06H00)			
Employees Health	Reduce health risks and environmental pollution	1. Provide at least one temporary toilet at a site alternatively, construct a pit latrine toilet which are widely used in the North. 2. Employees must not be exposed to noise levels above the 85dB (A) limit over a period of 8 hours. 3. Non-toxic human dust exposure levels may not exceed 5mg/m^3 for respiratory dust and 15mg/m^3 for total dust. 4. Provide adequate PPE	Visual Inspection. Deaf record and hearing complains. Respiratory complains	Site Manager	Non-compliant on provision of toilet. No complaint or incidence of noise / dust by employees
Public Health and Safety	To protect public health and safety	1. The excavated area/mining area must be properly fenced off to avoid	Visual inspection of fence	Site Manager	The areas is well fenced and access is restricted to both animal and

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		possible falling in on people and animals 2. Construction vehicles must have reflectors and visible head lumps to warn public.	Visual inspection		people. ETC confirmed that construction vehicle have reflectors as it is mandatory from Road Authority.
D. POLLUTION AND WASTE MANAGEMENT					
Waste generation	To manage solid waste To prevent littering, pollution, contamination of water and general environmental health hazards	1. Provide a bin for waste disposal, General waste must be separated from hazardous waste 2. Domestic Waste (Litter – cans, plastics, tissue, plastics etc.) must be disposed of at an appropriate site. 3. No onsite burying, dumping or burning of waste material shall be permitted.	Scattered waste, Littering and any other unsightly waste at the site (eyesore)	Site Manager	Compliant
Water	To avoid possible water contamination	1. Contaminated soils must be removed immediately and stored at a bunded designated area and only	Record of oil spill, contaminated	Site Manager	ETC indicated that vehicles are not allowed to re-fuel on site. When necessary, a temporary

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		be disposed of at the approved dumpsite. 2. No washing of vehicles and machinery on site 3. Vehicle must be well serviced to prevent oil leakages 4. All stationary vehicles and machinery must have drip trays under to collect oils and lubricant leakages 5. If fuelling is to be done on site, it must be done at designated place with a proper structure that would prevent spillage to the ground	soil, bunded structure		drip ray is place under the vehicle during
Oil Leakages	To prevent soil pollution, water pollution	1. All vehicle must be well serviced 2. Oils and fuels must be stored in appropriate drums and kept on impermeable bunded structure	Visual inspection	Site Manager	ETC indicated a temporary drip ray is place under the vehicle during serving

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		3. Stationary vehicle must be provided with drip tray to catch any possible leakages 4. No washing of vehicle / equipment is allowed on site 5. Provide a concrete cubicle for Bio-Remediation any spillage			
Vehicle emission		1. Avoid unnecessarily revving of engine 2. Vehicle must be well serviced	Public complaint	Site Manager	No public complaint recorded. The vehicle service books could not be assessed, as individual contractor were not available
E. CULTURAL HERITAGE					
Archaeological and artefact material buried human remains	To preserve artefacts, archaeological or human remain	1. Formulate a chance find strategy where if any archaeological material is found, artefacts or human remain is found; a. STOP the work	Number of findings reported	Site Manager	No report of archaeological material findings

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		b. Notify the Supervisor c. Cordon off the area d. Take pictures e. Notify the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461). f. Only remove material with permission from the Namibian National Heritage Council (NNHC)			
F. SOCIO-ECONOMICS					
Employment	To ensure local residents of are employed	1. Although employment is already done, ensure locals are employed or future employment must strictly be for locals residents	Labour unrest	Site Manager	ETC informed the assessment that, most workers are from the surrounding communities

Aspects	Objectives	Mitigation Measures	Indicators	Responsibility	Compliance Comment
		2. Adhere to the Namibia Labour Act 2007 for fair compensation and providing good working environment			
HIV/AIDS	To STOP the spread of HIV/AID pandemic	1. Provide HIV/AIDS awareness to employee 2. The government provide free condoms, ensure a box of condoms is on site or vehicles with employees	HIV/AIDS awareness meeting minutes	Site Manager	Non-Compliance. No friendly place such as toilet.
Alcohol and Drug Use	To prevent drug and alcohol abuse and foster a healthy lifestyle	1. Use of illegal drugs must be reported to the police 2. Do random alcohol testing and watch out for drunk behaviour 3. Teach workers about the danger of alcohol abuse and drugs	Number of reported case. Alcohol test results. Awareness Minutes	Site Manager	No recorded incidence of alcohol and drug abuse

Chapter 5. CLOSURE AND REHABILITATION PLAN/GUIDELINES

This chapter outlines the proposed closure plan and rehabilitation guidelines to be implemented after the sand resource has been exhausted.

Following extraction, the site will contain a borrow pit approximately 5–10 m deep. Completely refilling such a pit is impractical because it would require excavating an equivalent volume of material from elsewhere. ETC has proposed converting the borrow pit into a water-harvesting reservoir. Therefore, rehabilitation will follow procedures like those used for construction and rehabilitation of earth dams.

5.1. Rehabilitation approaches

There are two option that may be followed for rehabilitation i) Progressive Rehabilitation, ii) After Closure Rehabilitation. Progressive rehabilitation is mainly used for sites where revegetation is expected. While for sites aimed to be turned into water harvesting reservoirs, after closure rehabilitation is normally used.

5.1.1. Progressive Rehabilitation

This type of rehabilitation refers to rehabilitation of depleted part of the pit while operation continues on the other part of the pit (see Figure 3). During this time, excavated top soil must be filled back into the excavated area where slopes has been smoothened to 1:3 fall. The advantage of this rehabilitation is that, it reduces the total disturbed area, it is less costly in a sense that avoid double handling of filling materials and preserve top soil.

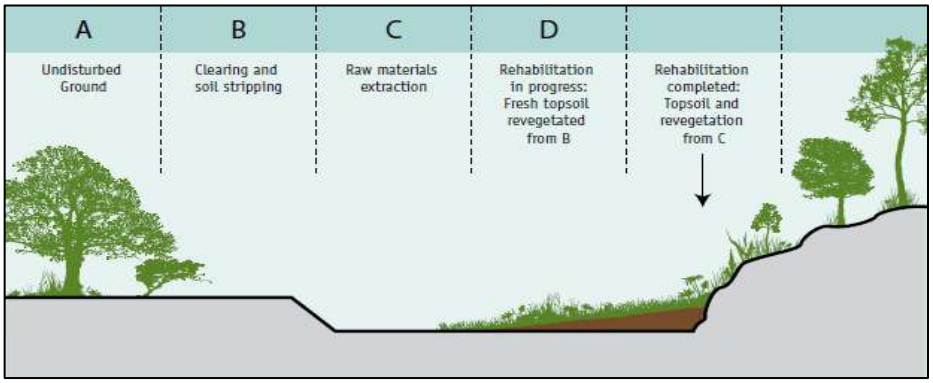


Figure 3. Progressive Rehabilitation (Earth Resources 2015)

5.1.2. After Closure Rehabilitation

This rehabilitation is done after the whole area is depleted of sand. During this stage, the pit walls are trimmed to a slope of 1:3 fall not back filling is required, the trimmed sloped are compacted to prevent collapse.

5.2. Rehabilitation guidelines

5.2.1. The Slope

During excavation, pit slopes are often steep and present several risks, including collapsing edge walls, people or animals falling into the pits, formation of gullies, and increased soil erosion and land degradation. It is therefore crucial that borrow-pit slopes be graded at an angle that minimizes these risks.

Ideally, borrow-pit slopes should be laid back to a ratio of 1:3 (Figure 4), meaning the slope falls one metre vertically for every three metres horizontally. These gentler slopes are safer for animals to enter the pit to drink, since the depth increases gradually, and they reduce the likelihood of wall collapse and erosion.

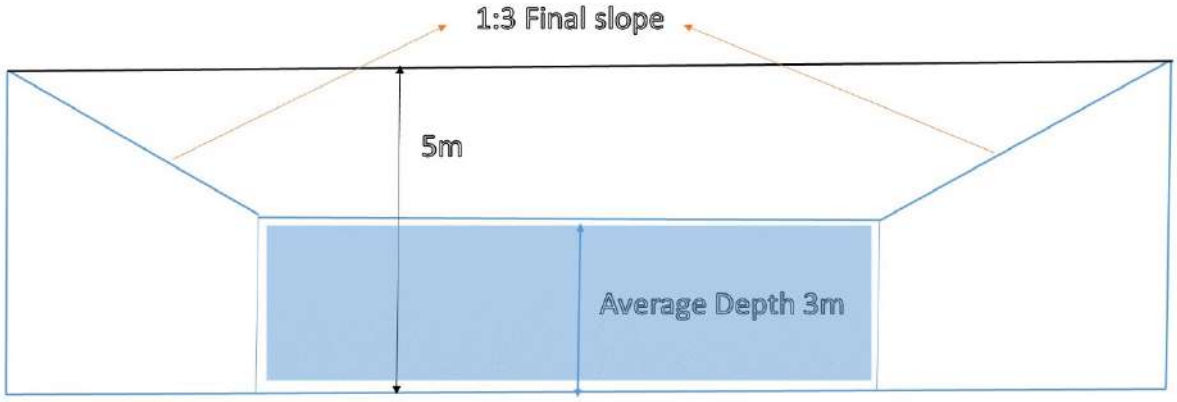


Figure 4. Illustration of the final slope (1:3 fall)

The following guidelines must be followed to ensure effective rehabilitation of the borrow pit:

1. Maintain a 5 m buffer zone from the mining boundary
    - This ensures trimming and rehabilitation remain within the project area.
2. Use soil from the buffer zone to reshape slopes to a maximum of 1:3
    - A 1:3 slope (1 m vertical to 3 m horizontal) promotes smooth runoff, reduces risk of wall collapse, and improves safety for people and animals.

- Orient the pit mouth toward the natural drainage direction so water enters and exits smoothly. Construct a permanent drainage channel or spillway to control inflow/outflow and prevent gully formation and accelerated erosion.

3. Retain perimeter fencing for safety
    - Keep fencing in place until the site is fully stabilised and made safe for public access.
4. Construct an earth bund around the pit using surplus soil
    - Form a continuous earth bund to divert surface runoff away from the pit, reduce gully formation and limit further land degradation.
5. Decompact areas exposed to heavy vehicle traffic
    - Ripped or loosen compacted surfaces to improve infiltration and promote re-vegetation. After ripping, replace topsoil where available and seed with appropriate native species.

Chapter 6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusions

The environmental audit of Eenhana Town Council's sand-mining site of 25 July 2025 found that the operation is generally managed in accordance with the approved Environmental Management Plan (EMP) and applicable regulatory requirements. Site controls, perimeter fencing, restricted access security presence are in place. No active extraction was observed during the visit, and no material instances of non-compliance were identified from the site inspection and document review.

However, the audit identified foreseeable environmental and safety risks associated with the scale and depth of excavation (approximately 0.28 ha; 3–4 m deep) in a loose sandy substrate. Key risks include windborne dust, erosion and gully formation, pit stability and public/animal safety, potential impacts to groundwater/hydrology, and the need for systematic recordkeeping and monitoring to demonstrate ongoing compliance particularly during active extraction periods.

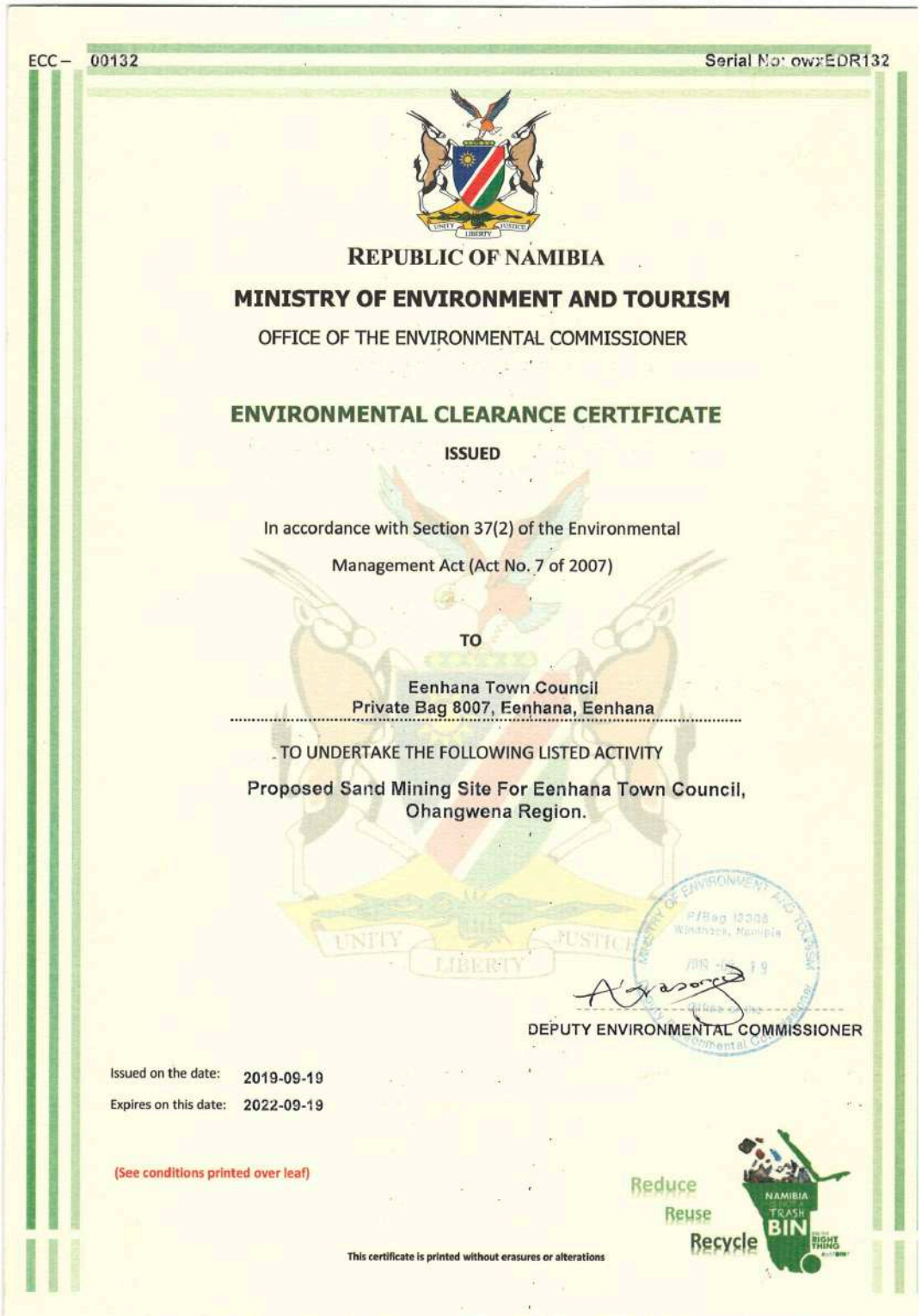
6.2. Recommendation

1. Stabilisation and progressive rehabilitation
    - Rehabilitate and stabilise exposed areas progressively where practicable. Regrade slopes to the recommended 1:3 ratio, replace with topsoil where available, and begin revegetation using native species.
2. Safety controls for open pits
    - Maintain and reinforce perimeter fencing and signage; restrict public access and maintain guard until the site is stabilised or converted to a managed reservoir.
3. Dust suppression
    - Apply water spraying on haul roads, stockpiles and working faces during active operations; enforce speed limits and cover loads on trucks to minimise fugitive dust.
4. Recordkeeping and reporting
    - Maintain complete, up-to-date records: extraction volumes, maintenance records, PPE issuance, training/induction registers, incident and complaint logs, and monitoring results. Produce bi-annual compliance reports for management and the Ministry.

5. Red-Dune Consulting recommends the Ministry to renew the ECC and for ETC to ensure that all necessary measures are implemented.

Chapter 7. Annexures

7.1. Annex 1. Expired ECC for ETC Sand Mining



ECC – 00132 Serial No: owzEDR132

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

Eenhana Town Council
Private Bag 8007, Eenhana, Eenhana

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

Proposed Sand Mining Site For Eenhana Town Council, Ohangwena Region.

DEPUTY ENVIRONMENTAL COMMISSIONER

Issued on the date: 2019-09-19

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