ENVIRONMENTAL SCOPING ASSESSMENT:
For the Sand and Aggregate Quarrying in Emono Village, Oshana Region, Namibia

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Project Title	Environmental Scoping Assessment for Sand and Aggregate Quarrying in Emono Village, Oshana Region, Namibia
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Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

BID	Background Information Document
CV	Curriculum Vitae
DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
ESA	Environmental Scoping Assessment
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
NSA	Namibia Statistics Agency
NPC	National Planning Commission
PPE	Personal Protective Equipment
Reg	Regulation
TOR	Terms of Reference

DEFINITION OF TERMS

The following definitions apply throughout this report:

Alternative: A possible course of action, in place of another, that would meet the same purpose and requirements of the proposed activity.

Baseline: Information collected and interpreted to describe the condition and trends of the existing environment prior to project implementation.

Environment: As defined in the Environmental Management Act: the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect ecological equilibrium

and quality of life. This includes (a) the natural environment — land, water, air, organic and inorganic matter, and living organisms; and (b) the human environment — landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.

Environmental Management Plan (EMP): As defined in the EIA Regulations (Section 8(j)): a plan that describes how activities with potentially significant environmental effects are to be mitigated, controlled, and monitored.

Interested and Affected Party (I&AP): As defined in the EMA: (a) any person, group of persons, or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.

Mitigation: Practical measures designed to avoid, reduce, remedy, or compensate for identified adverse environmental impacts.

Proponent: An organization (private or public sector) or individual intending to implement a development proposal.

Public Consultation: A range of techniques used to inform, consult, or interact with stakeholders affected by or interested in the proposed activities.

Scoping: The process of identifying the key environmental and social issues, impacts, and alternatives that must be addressed in an environmental assessment.

Significant Impact: 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.

EXECUTIVE SUMMARY

The Uukwambi Traditional Authority (hereinafter referred to as “the Proponent”) has identified and proposes to carry out sand and aggregate quarrying operations on an existing borrow pit at Emono Village, Okatana Constituency, Oshana Region, Namibia. The sand deposit has been assessed as suitable for quarrying sand for construction purposes, including the manufacture of bricks and related building materials.

Sand mining activities are listed activities under the Environmental Management Act No. 7 of 2007 (EMA) and its Environmental Impact Assessment (EIA) Regulations (GN No. 30 of 2012), accordingly, an Environmental Clearance Certificate (ECC) must be obtained from the Ministry of Environment, Forestry and Tourism (MEFT) before the commencement of any mining operations. This Environmental Scoping Assessment (ESA) Report has been prepared by Malta Environmental Consulting Solutions cc on behalf of the Proponent to fulfil this regulatory requirement. The report identifies and evaluates the potential environmental and socio-economic impacts of the proposed activities, and recommends appropriate mitigation and management measures to minimise adverse effects.

Most potential negative impacts were assessed as medium significance prior to mitigation. With the consistent application of the recommended mitigation measures, all impacts are expected to be reduced to low significance. The Proponent, or their appointed Environmental Control Officer (ECO), is required to monitor the implementation of these measures throughout the project lifecycle.

1 INTRODUCTION

1.1 Project Background

The Uukwambi Traditional Authority (hereinafter referred to as “the Proponent”) has identified and proposes to carry out sand and aggregate quarrying operations on an existing borrow pit at Emono Village, Oshana Region, Namibia. The sand deposit has been assessed as suitable for quarrying sand for construction purposes, including the manufacture of bricks and related building materials.

The Uukwambi Traditional Authority, as the custodian of cultural heritage, natural resource management, and economic development within its area of jurisdiction, has identified the need for locally accessible construction materials to support ongoing and planned infrastructure improvements in the Okatana Constituency. Recognizing the importance of responsible and sustainable resource extraction, the Authority proposes to resume operations at an existing borrow pit at Emono Village, which contains sand deposits suitable for construction and brick manufacturing.

In accordance with the Environmental Management Act No. 7 of 2007 and its EIA Regulations (GN No. 30 of 2012), the proposed activities constitute listed activities for which an Environmental Clearance Certificate (ECC) is required prior to commencement. The following activities apply:

- Activity 3.2 — Other forms of mining or extraction of any natural resources, whether regulated by law or not.
- Activity 3.3 — Resource extraction, manipulation, conservation, and related activities.

This Environmental Scoping Assessment (ESA) Report has been prepared to support the ECC application to be submitted to the Department of Environmental Affairs and Forestry (DEAF) at the Ministry of Environment, Forestry and Tourism (MEFT).

1.2 Terms of Reference and Scope of Work

Malta Environmental Consulting Solutions cc has been appointed by the Uukwambi Traditional Authority to conduct this Environmental Scoping Assessment and to apply for the required Environmental Clearance Certificate on behalf of the Proponent. In the absence of formal Terms of Reference (ToR) provided by the Proponent, the study was conducted in accordance with the requirements of the Environmental Management Act No. 7 of 2007 and its EIA Regulations (GN No. 30 of 2012).

The ECC application has been compiled and submitted to MEFT for project registration (refer to Appendix A). Following completion of this ESA Report and the Draft Environmental Management Plan (EMP), the Environmental Commissioner at the DEAF will consider the application for an ECC.

1.3 Need for the Proposed Project

The Uukwambi Traditional Authority recognizes the growing demand for construction materials within the Okatana Constituency and the broader Oshana Region, driven by urbanization, population growth, and the associated need for housing and infrastructure development. Locally sourced construction sand reduces dependence on distant supply chains, lowers material costs, and supports local employment. By formalizing the operation of the Emono borrow pit through the acquisition of an ECC, the Authority seeks to ensure that sand extraction is conducted sustainably, in compliance with regulatory requirements and environmental best practice.

2 PROJECT DESCRIPTION

Sand mining at a borrow pit typically involves the removal of topsoil using a front-end loader or excavator to expose and extract the underlying sand deposit. The sand extracted from the Emono borrow pit will serve as a key input for local construction projects, providing a sustainable and responsible source of building materials including concrete, roads, bricks, and other construction products. By sourcing sand locally, Emono Village and the wider Okatana Constituency can reduce dependence on materials transported from distant locations, promoting greater self-sufficiency and economic resilience. Figure 1 provides a locality map of the proposed project area.

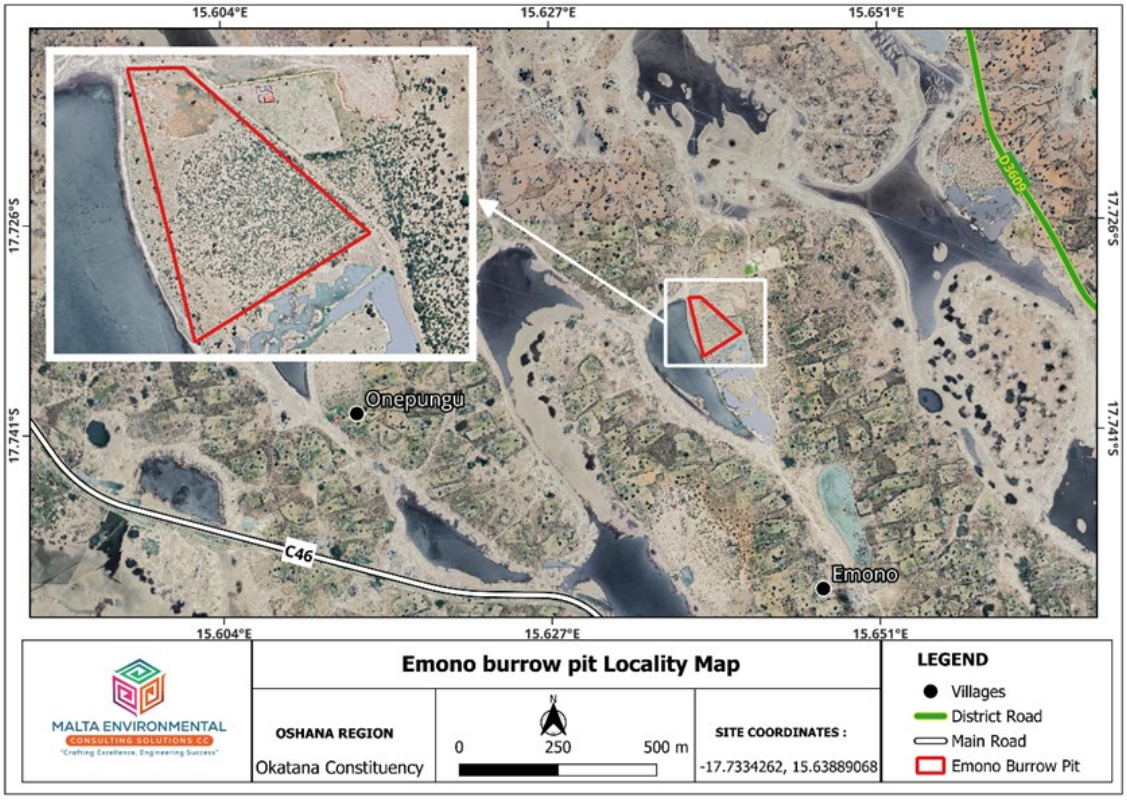

Figure 1: Locality Map

Figure 2: Emono borrow pit site (fenced off).

2.1 Operational and Maintenance Phase

During the operational phase, sand mining will be conducted in a controlled and environmentally responsible manner. Extraction will be limited to the topsoil layer down to the level of the underlying clay substrate; operations will cease upon reaching clay to prevent destabilization of

the pit. A comprehensive Environmental Management Plan (EMP) will govern all activities to ensure ongoing environmental compliance and long-term sustainability.

The maintenance phase runs concurrently with the operational phase. It involves systematic monitoring and evaluation of all mining activities and the effectiveness of environmental mitigation measures to ensure continued compliance with the approved EMP. Adjustments will be made as required in response to monitoring findings.

2.2 Decommissioning Phase

When mining operations reach a depth at which clay soil is encountered, the extraction of sand must be decommissioned to prevent further destabilization of the pit and potential environmental degradation. Extracted topsoil will be progressively restored and the borrow pit rehabilitated in accordance with the EMP. This approach reflects the Proponent's commitment to responsible and sustainable mining practices. Temporary decommissioning of sections of the pit will also occur following topsoil removal to allow for restoration before re-opening, where applicable.

2.3 Site Resources

Table 1: Site resources for the proposed project

Human Resources	5–10 personnel employed and accommodated on-site during the mining phase.
Water Supply	Water required for operational activities, personal hygiene, and drinking.
Fuel Supply	Diesel fuel to power all on-site machinery and equipment.
PPE & First Aid	Appropriate Personal Protective Equipment provided to all personnel; minimum of two first aid kits maintained on-site at all times.
Fire Safety	Fire extinguishers available in all vehicles, at operational areas, and at campsites.
Equipment	Front-end loader, tipper truck, and other plant and machinery as required.

2.4 Services Infrastructure

A single access road will serve as the only entry and exit point for all mining activities and material transportation. No additional roads or access points will be permitted. The road will be designed and maintained to minimise environmental impacts while ensuring the safe and efficient transportation of sand during the mining phase.

2.5 Waste Management

Table 2: Waste Management

Sewage	Flushing ablution facilities will be present on-site.
Solid Waste	Adequate waste containers provided at all operational areas and campsites; waste disposed of at the nearest approved waste disposal facility.
Hazardous Waste	Used fuel and oils stored in approved standardised containers; disposed of at an approved hazardous waste management facility in the nearest town.

3 PROJECT ALTERNATIVES

Alternatives are defined under the EMA (2007) as “the different means of meeting the general purpose and requirements of the activity.” This section identifies and evaluates the alternatives considered for the proposed project, examining each in terms of:

- Technical and economic feasibility;
- Associated environmental effects; and
- Rationale for selecting the preferred alternative.

3.1 The “No-Go” Alternative

The no-go alternative would require the Uukwambi Traditional Authority to forgo sand mining at the Emono site entirely. This would perpetuate a shortage of locally available construction materials, increase reliance on distant and costly supply sources, and curtail employment and economic development opportunities within the constituency. The no-go option would not advance the Authority’s mandate to support sustainable development and improved living standards. Given the social and economic benefits of the proposed project and its manageable environmental footprint, the no-go alternative is not considered the preferred option.

3.2 Project Location

The Emono Village site was selected by the Proponent based on its established sand deposit of high quality suitable for construction and brick manufacturing. The site is an existing borrow pit, minimizing the extent of new ground disturbance. Following a comprehensive site assessment and stakeholder consultation process, all necessary agreements were concluded with the landowner in compliance with applicable legal and community requirements. No alternative sites within the area were identified as offering comparable sand quality or logistical suitability.

3.3 Alternative Land Use

A careful analysis of potential land use options for the Emono site was undertaken. Given the presence of a quality sand deposit, the history of borrow pit use at the site, the absence of competing viable land uses, and the pressing need for construction materials in the constituency, sand and aggregate quarrying is considered the optimal land use for this area. No superior alternative land use was identified that would yield comparable community or economic benefit.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES, AND GUIDELINES

Sand mining and related activities in Namibia are governed by a suite of national legislation, policies, and guidelines. The applicable instruments relevant to the proposed Emono borrow pit sand mining operation are summarized in Table 1 below. This summary is intended to inform the Proponent, I&APs, and decision-makers at the DEAF of the regulatory requirements to be fulfilled in relation to the proposed activity.

4.1 Applicable Legislation

Table 3: Applicable local, national, and international standards, policies and guidelines governing the proposed development

Legislation / Policy / Guideline	Relevant Provisions	Implications for this Project
Environmental Management Act (EMA) No. 7 of 2007	Requires that projects with potentially significant environmental impacts are subject to an environmental assessment process (Section 27). Establishes principles to guide all EAs. Defines listed activities requiring an ECC.	This EMA and its Regulations form the primary legal basis for this ESA process. The proposed activities (Activity 3.2 and 3.3) are listed activities requiring an ECC from MEFT.
EIA Regulations GN No. 28–30 (GG 4878) of 2012	Details requirements for public consultation within an EA process (GN 30, Section 21). Specifies content requirements for a Scoping Report (GN 30, Section 8) and an Assessment Report (GN 30, Section 15).	This ESA has been prepared and the public participation process conducted in accordance with these Regulations.
Constitution of the Republic of Namibia, 1990 (as amended)	Article 91(c) mandates the Ombudsman to investigate complaints concerning over-utilisation of living natural resources, irrational exploitation of non-renewable resources, and degradation of ecosystems. Article 95(l) commits the State to sustainable use of natural resources.	The project EMP must ensure ecological sustainability and responsible resource management, consistent with constitutional obligations.
The Regional Councils Act No. 22 of 1992	Establishes Regional Councils and defines their planning and development functions, including land use planning and environmental sensitivity (Section 28).	The relevant Regional Council (Oshana) is considered an I&AP and must be consulted as part of this EA process.
Water Act No. 54 of 1956	Prohibits the pollution of water and places a duty of care on persons disposing of effluent or waste (Section 3(k)). Provides for control and protection of groundwater (Section 66(1)(d)(ii)). Establishes liability for clean-up costs after closure of an activity.	Protection of surface and groundwater quality is a priority. Mitigation measures must ensure that fuel, oil, and waste do not contaminate water resources.

Legislation / Policy / Guideline	Relevant Provisions	Implications for this Project
Water Resources Management Act No. 11 of 2013	Provides for the management, protection, development, use, and conservation of water resources. Requires protection of aquifers (Section 66) and prevention of water pollution (Section 68).	Groundwater protection measures must be included in the EMP.
National Heritage Act No. 27 of 2004	Provides for the protection and conservation of places and objects of heritage significance. Establishes the National Heritage Council and National Heritage Register.	The Proponent must consult with the National Heritage Council of Namibia and ensure compliance with permitting requirements where heritage resources may be affected.
National Monuments Act No. 28 of 1969	Enables the proclamation of national monuments and protects archaeological sites from damage or destruction.	Any discovery of archaeological material during operations must be reported immediately and work halted pending assessment.
Soil Conservation Act No. 76 of 1969	Provides for the prevention and control of soil erosion, and the protection, improvement, and conservation of soil, vegetation, and water supply sources.	A duty of care applies to soil conservation. Soil erosion mitigation measures must be included in the EMP.
Public Health Act No. 36 of 1919	Section 119 prohibits persons from causing or permitting the existence of nuisances or conditions liable to be injurious or dangerous to health on land or premises they own or occupy.	The Proponent and all personnel must ensure that operational activities do not create health hazards for workers or surrounding communities.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding the health and safety of workers.	All on-site personnel must be provided with appropriate PPE and safety training. Regular safety monitoring must be conducted.
Road Traffic and Transport Act No. 22 of 1999	Provides for the control of traffic on public roads, licensing of drivers, and registration and licensing of vehicles. Relevant transport permits must be obtained for haulage activities.	Mitigation measures must address increased road traffic and haulage impacts. All relevant permits must be obtained prior to commencement.

Legislation / Policy / Guideline	Relevant Provisions	Implications for this Project
Labour Act No. 6 of 1992	Promotes harmonious labour relations, social justice, and occupational health and safety across Namibia.	The Proponent must ensure that employment conditions, worker safety, and welfare comply fully with the provisions of the Labour Act.

5 ENVIRONMENTAL BASELINE

Understanding the pre-project environmental and social conditions of the proposed project area is essential to identifying sensitive features that require protection and to providing a benchmark against which future environmental changes can be measured. The baseline information presented below draws on published regional studies, available government data, and observations made during the consultant's site visit.

5.1 Climate

The Oshana Region experiences a semi-arid climate typical of northern Namibia, characterized by distinct wet and dry seasons. Rainfall is highly seasonal, occurring primarily between November and April, with a long-term mean annual precipitation ranging from approximately 450 to 550 mm. Temperatures are generally high year-round, with summer maxima frequently exceeding 35°C. The dry season (May to October) is characterized by low humidity, high evaporation rates, and strong winds that can mobilize dust from exposed soil surfaces. These climatic conditions are relevant to the assessment of dust and erosion impacts associated with the proposed mining activities.

5.2 Topography

The proposed project site is located within the Cuvelai System, a shallow drainage basin spanning approximately 10 703 km² (approximately 1.3% of Namibia's total land area). The topography of the region is characteristically flat, with an average elevation of approximately 1 181 metres above sea level. This low-relief landscape facilitates surface water accumulation in the Cuvelai oshanas (shallow ephemeral watercourses and pans) during the rainy season. A topographic map of the project area is presented as Figure 3.

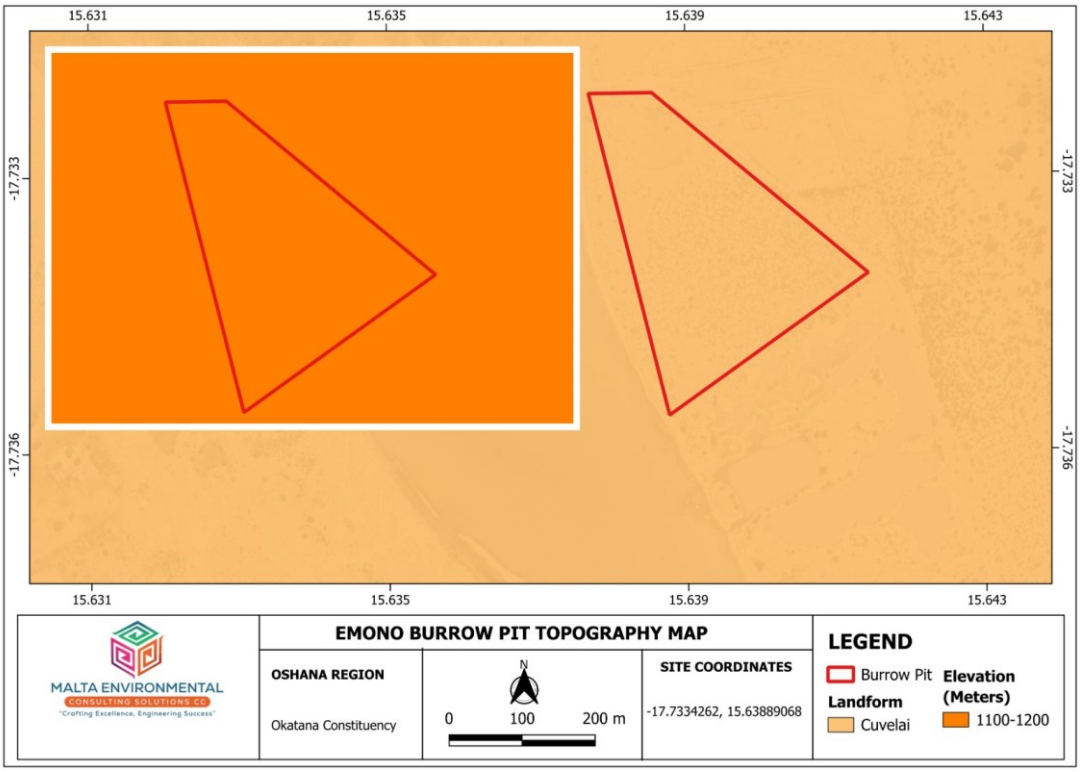

Figure 3: topographic map

5.3 Soils

The dominant soil types in the Oshana Region include Haplic Calcisols, which are typically automorphic soils found at slightly higher elevations and are not significantly influenced by excess water or salinity. These soils are generally shallow with moderate permeability. In lower-lying areas, soils with high clay content are common, corresponding to the clay substrate that defines the operational limit of the proposed borrow pit.

Figure 4: Soil type observed at the project site

5.4 Geology

The geology of the Oshana Region is dominated by Kalahari Group sediments, comprising aeolian and fluvial sands overlying older basement rocks. These superficial deposits contain the sand and aggregate resources targeted by the proposed mining operation. The underlying geology is generally stable; however, excavation to clay depth must be managed carefully to avoid pit wall instability.

5.5 Hydrology and Water Resources

The project area lies within the Cuvelai-Etosha Basin, one of Namibia's most important surface water systems, which supports the livelihoods of a large proportion of the northern Namibian population. The oshana system, comprising networks of shallow channels and pans, transports and stores ephemeral floodwater from Angola during the rainy season. Groundwater occurs in alluvial aquifers beneath the Cuvelai System and is accessed through boreholes for domestic and agricultural use. The proposed borrow pit does not intersect any perennial watercourse; however, the potential for surface runoff contamination and groundwater impacts from fuel and oil spills must be carefully managed.

5.6 Fauna and Flora

The project site falls within the broadleaved tree and shrub savanna vegetation biome. This ecosystem is characterized by the co-dominance of grasses, shrubs, and trees, and is geographically extensive and ecologically significant. Trees and shrubs play a critical role in regulating water distribution, improving soil nutrient status, and providing habitat and food resources for wildlife. The study area supports a diversity of domesticated animals as well as native wildlife species, reflecting the ecological richness of the region.

The plant communities present at the site reflect the local environmental conditions and include species typical of the Cuvelai System. Clearing should be restricted to the active mining footprint and rehabilitated progressively.

Figure 5: Vegetation observed near the site

5.7 Socio-Economic Status

According to the Namibia Statistics Agency (NSA, 2011 Population and Housing Census), the Oshana Region has a population of approximately 176 674 persons, representing one of the more densely populated regions in northern Namibia. The regional economy is predominantly dependent on subsistence agriculture, small-scale trade, and public sector employment. Construction activity and infrastructure development are growing sectors, underpinned by increasing urbanisation around Oshakati and Ondangwa. Access to locally sourced construction materials such as sand is therefore of direct economic importance to the region.

Emono Village falls within the Okatana Constituency. The local community is predominantly engaged in subsistence farming, supplemented by informal trade and employment in the public and private sectors. The proposed sand mining operation has the potential to create direct employment for 5–10 community members, as well as indirect benefits through the supply of affordable construction materials to local builders and contractors.

6 PUBLIC CONSULTATION PROCESS

Public consultation is a mandatory and integral component of the Environmental Assessment process under the EMA No. 7 of 2007 and its EIA Regulations (Sections 21 to 24). It affords Interested and Affected Parties (I&APs) the opportunity to comment on the proposed project, raise concerns, and contribute to the identification of potential impacts and appropriate mitigation measures. The public participation process for this ESA was conducted in full compliance with these regulatory requirements.

6.1 Pre-Identified and Registered Interested and Affected Parties (I&APs)

Relevant national, regional, and local authorities, traditional leaders, and interested members of the public were identified prior to the commencement of the public participation process. Pre-identified I&APs were contacted directly. Members of the public who responded to the public and contacted attended the public consultation meeting.

Table 4: Summary of Interested and Affected Parties (I&APs)

Category	I&AP / Organization
National (Ministries and State-Owned Enterprises)	Ministry of Agriculture, Water and Land Reform and Ministry of Environment, Forestry and Tourism (Department of Environmental Affairs and Forestry)
Regional and Local Authorities	Oshana Regional Council, Okatana Constituency Office and Uukwambi Traditional Authority
General Public	Community members of Emono Village and surrounding areas

6.2 Communication with I&APs

Communication with I&APs was conducted through the following methods:

- A public meeting was convened on 2nd of November 2025 at Emono Village, Okatana Constituency, to engage directly with community members and other I&APs. The meeting was attended by residents and community leaders under a Marula Tree near Emono Church.
- The second ordinary regional council meeting was held on the 10th of February 2026 at 09h00 at the Oshana Regional Council Chamber.

6.3 Public Feedback

During the public consultation process, community members from Emono Village raised the need for a perimeter fence to be erected before the commencement of mining operations. The proposed fencing would serve as a critical safety measure, preventing unauthorised access to the excavation site and protecting members of the public, particularly children from potential hazards during mining operations. This feedback has been incorporated into the Environmental Management Plan as a recommended mitigation measure, and its implementation is required prior to the commencement of sand extraction activities.

7 IMPACT IDENTIFICATION, ASSESSMENT, AND MITIGATION MEASURES

7.1 Impact Identification

Sand mining activities have the potential to generate both positive and negative impacts on the biophysical and social environment. The focus of this assessment is on identifying and addressing negative impacts, while acknowledging the positive contributions of the proposed project. The following impacts have been identified for the proposed sand mining activities at the Emono borrow pit:

Positive Impacts

- Socio-economic development through employment creation and skills transfer to local community members.
- Investment opportunities and infrastructure-related development benefits in the Okatana Constituency and Oshana Region.
- Development of a trained local workforce and support for the growth of small businesses in the area.
- Stimulation of local and regional economic activity.
- Increased supply of sand for local businesses and the construction industry.

Negative Impacts

- Soil and water pollution from fuel, oil, and waste.
- Degradation of air quality through dust generation.
- Disturbance to local fauna and flora (biodiversity).

- Occupational and community health and safety risks.
- Increased vehicular traffic and associated road impacts.
- Visual impact on the local landscape.
- Noise pollution from machinery and equipment.
- Waste generation and improper disposal.
- Impact on archaeological and cultural heritage resources.

7.2 Impact Assessment Methodology

The impact assessment methodology applied in this ESA is consistent with the requirements of the Environmental Management Act No. 7 of 2007 and its EIA Regulations of 2012. Each identified impact was assessed in terms of four criteria: extent (spatial scale), duration (temporal scale), intensity (magnitude/severity), and probability (likelihood of occurrence). A numerical value was assigned to each criterion to enable a standardized and comparative assessment of impact significance.

The significance of each impact was determined using the following formula:

Significance Points (SP) = (Intensity + Duration + Extent) × Probability

The maximum possible significance score is 100 points. Each impact was assessed both before and after the implementation of recommended mitigation measures (pre-mitigation and post-mitigation). The rating scales applied are presented in Tables below.

7.2.1 Extent (spatial scale)

Table 5: Extent or Spatial Impact Rating Scale

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localised within the site boundary only.	Impact extends beyond the site boundary at a local level.	Impact felt within adjacent biophysical and social environments at a regional level.	Impact is widespread, far beyond the site boundary.	Impact extends nationally or across international boundaries.

7.2.2 Duration

Table 6: Duration Impact Rating Scale

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediately reversible with mitigating measures.	Short-term impacts (0–5 years), quickly reversible.	Reversible over time; medium-term (5–15 years).	Long-term impact beyond operational closure.	Permanent, irreplaceable, or irretrievable commitment of resources.

7.2.3 Intensity, Magnitude / severity

Table 7: Intensity, Magnitude, and Severity Impact Rating Scale

High (10)	Medium/High (8)	Medium (6)	Medium/Low (4)	Low (2)
Very high deterioration; high number of deaths, injuries, or illness; total loss of habitat; extinction of rare species.	Substantial deterioration; deaths, illness, or injury; severe loss of habitat, diversity, or ecological processes.	Moderate deterioration; partial loss of habitat or biodiversity; moderate alteration of ecological processes.	Low deterioration; slight, noticeable alteration in habitat and biodiversity; little loss in species numbers.	Minor deterioration; minor change in species, habitat, or diversity; negligible quality deterioration.

7.2.4 Probability of occurrence

Table 8: Probability of Occurrence Impact Rating Scale

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; no known risk or vulnerability.	Likely to occur from time to time; low risk or vulnerability.	Possible; distinct possibility; frequent; low to medium risk.	Probable if mitigation measures are not implemented; medium risk.	Definite regardless of preventative measures; continuous; high risk.

7.2.5 Significance

Table 9: Significance Rating Scale

Significance	Environmental Significance Points	Colour Code
High (positive)	**>60**	**H**
Medium (positive)	**30 to 60**	**M**
Low (positive)	**<30**	**L**
Neutral	**0**	**N**

Significance	Environmental Significance Points	Colour Code
Low (negative)	> -30	L
Medium (negative)	-30 to -60	M
High (negative)	> -60	H

For impacts rated as high significance, mitigation measures are required to reduce the rating to medium or low. For medium-significance impacts, mitigation measures must be implemented and monitored to confirm their effectiveness. Impacts rated as low significance are to be monitored to ensure they remain within acceptable levels.

7.3 Assessment of Potential Negative Impacts

7.3.1 Soil and Water Pollution

Fuel and lubricant spills from mining vehicles and equipment represent the primary source of soil and water contamination risk at the borrow pit. Direct contamination of surrounding soils can adversely affect soil microorganisms, plant life, and human health. If left unmanaged, spilled fuels and oils may infiltrate the soil profile and contaminate underlying groundwater resources, with potential impacts on domestic water supply and aquatic ecosystems. Proper waste management practices, spill containment equipment, and regular vehicle maintenance are essential to minimise this risk.

Table 10: Assessment of the impacts of sand mining on soil and water resources

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	M – 3	L/M – 2	M – 6	M/H – 4	**M – 44**
Post-Mitigation	L/M – 2	L/M – 2	L – 2	L/M – 2	**L – 12**

Recommended mitigation measures include:

- Maintaining an on-site spill kit and emergency response procedure for fuel and oil spills.
- Storing fuel in bunded, approved containers away from watercourses and drainage features.
- Conducting regular inspection and maintenance of all vehicles and equipment.
- Disposing of hazardous waste (used oil and fuel) at an approved facility in the nearest town.
- Training all personnel in spill prevention, containment, and clean-up procedures.

7.3.2 Air Quality (Dust)

Sand mining activities generate dust through excavation, the loading and transport of materials, and vehicle movement on unpaved surfaces. Dust particles pose a direct health risk to on-site workers through inhalation, which can cause or exacerbate respiratory conditions. Airborne dust may also affect residents and livestock in the immediate vicinity of the borrow pit. Given the semi-arid climate and seasonal dry conditions, dust generation has the potential to extend beyond the site boundary if not adequately controlled.

Table 11: Assessment of the impacts of sand mining on air quality

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	L/M – 2	L/M – 2	M – 6	M – 3	**M – 30**
Post-Mitigation	L – 1	L/M – 2	L – 2	L/M – 2	**L – 10**

Recommended mitigation measures include:

- Wetting unpaved haulage roads and the active mining face during dry and windy conditions.
- Covering loaded tipper trucks during transport to prevent dust dispersion.
- Restricting vehicle speeds on unpaved surfaces to minimise dust generation.
- Providing appropriate respiratory PPE (e.g., dust masks) to all on-site personnel.
- Avoiding mining activities during excessively windy conditions where practicable.

7.3.3 Biodiversity: Fauna and Flora

Sand mining activities involve the removal of topsoil and associated vegetation, which can disrupt local ecosystems by eliminating habitat for native plant and animal species. Vehicle and machinery movement beyond the active mining footprint can damage vegetation and compact soils. Disturbance of breeding areas and foraging habitat may displace local fauna to less suitable areas. Over time, the removal of native vegetation may create opportunities for invasive alien plant species to colonize disturbed areas, further altering the ecological character of the site.

Table 12: Assessment of the impacts of sand mining on biodiversity (fauna and flora)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	L/M – 2	L/M – 2	M – 6	M – 3	**M – 30**
Post-Mitigation	L – 1	L/M – 2	L – 2	L/M – 2	**L – 10**

Recommended mitigation measures include:

- Restricting vegetation clearing to the active mining footprint only; no unnecessary clearing beyond the designated area.
- Progressively rehabilitating mined areas by replacing topsoil and re-establishing indigenous vegetation.
- Prohibiting the removal of trees or shrubs outside the approved operational area.
- Conducting a pre-clearing survey to identify and relocate fauna where practicable.
- Monitoring rehabilitated areas for invasive alien plant establishment and implementing control measures as required.

7.3.4 Health and Safety

Worker and community safety during sand mining may be compromised by a range of factors, including improper handling of machinery and materials, inadequate personal protective equipment, insufficient safety signage, alcohol consumption on site, and unauthorised access to the excavation. These hazards increase the risk of accidents, injuries, and fatalities. Community members, particularly children, face additional risks from unguarded pit edges and vehicle movements. The erection of a perimeter fence prior to the commencement of operations is a key community requirement and a critical safety mitigation measure.

Table 13: Assessment of the impacts of sand mining on health and safety

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	M – 3	L/M – 2	M – 6	M/H – 4	**M – 44**
Post-Mitigation	L/M – 2	L/M – 2	L – 2	L/M – 2	**L – 12**

Recommended mitigation measures include:

- Erecting a perimeter fence around the borrow pit prior to the commencement of operations.
- Providing all on-site personnel with appropriate PPE (hard hats, high-visibility vests, safety boots, gloves, dust masks, and ear protection where required).
- Maintaining a minimum of two first aid kits on-site at all times.
- Conducting induction training for all workers on site safety procedures and hazard awareness.
- Implementing a strict no-alcohol policy on-site.
- Erecting clear safety signage at all access points and along the perimeter fence.

7.3.5 Vehicular Traffic Safety

The haulage of sand by heavy vehicles will increase traffic volumes on local roads, which may result in road deterioration, traffic congestion. If no mitigation measures are implemented, the impact of increased vehicular traffic due to sand mining activities will be rated medium significance. However, by implementing the mitigation measures, the significance of the impact can be reduced to low significance.

Table 14: Assessment of the impacts of sand mining on vehicular traffic and road infrastructure

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	L/M – 2	L/M – 2	M – 6	M – 3	**M – 30**
Post-Mitigation	L/M – 2	L/M – 2	L – 2	L/M – 2	**L – 12**

Recommended mitigation measures include:

- Limiting heavy vehicle movements to designated hours to avoid peak pedestrian and road use periods.
- Ensuring all vehicles are roadworthy, licensed, and operated by qualified drivers.
- Erecting traffic warning signage in the vicinity of the site and along haulage routes.
- Reducing vehicle speeds in and around Emono Village and on access roads.
- Obtaining all relevant road transport permits from the Road Traffic Inspectorate.

7.3.6 Visual Impact

The presence and operation of a borrow pit alters the natural landscape, creating an open excavation visible from the surrounding area. The visual intrusion of the pit, together with associated infrastructure such as stockpiles, equipment, and vehicle movements, may reduce the aesthetic quality of the environment for nearby residents and community members. The Emono borrow pit is located in a relatively flat, open landscape where visual changes may be noticeable from a distance. If no mitigation measures are implemented, the visual impact of sand mining activities on the local landscape will be rated medium significance. However, by implementing the mitigation measures, the significance of the impact can be reduced to low significance

Table 15: Assessment of the visual impacts of the sand mining operation

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	M – 3	M – 3	M – 6	M – 3	**M – 36**
Post-Mitigation	L/M – 2	L/M – 2	L/M – 4	L/M – 2	**L – 16**

Recommended mitigation measures include:

- Ensuring the site is kept tidy and free of litter, excess stockpiles, and unused equipment.
- Progressively rehabilitating mined areas to restore the natural appearance of the landscape.
- Screening the perimeter fence with fast-growing indigenous vegetation where practicable.

7.3.7 Noise

The operation of mining equipment and heavy vehicles generates noise that may adversely affect the health and wellbeing of on-site workers and nearby residents. Prolonged exposure to high noise levels without appropriate hearing protection can result in permanent hearing damage. Noise disturbance may also affect residents in proximity to the borrow pit, particularly during early morning or late evening operations. Workers operating or working in close proximity to the mining equipment and machinery may need to be provided with appropriate personal protective equipment (PPE), such as earplugs or earmuffs, to protect their hearing. If no mitigation measures are implemented, the visual impact of sand mining activities on the local landscape will be rated medium significance. However, by implementing the mitigation measures, the significance of the impact can be reduced to low significance

Table 16: Assessment of the noise impacts from sand mining operations

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	L/M – 2	L/M – 2	M – 6	M – 3	**M – 30**
Post-Mitigation	L – 1	L/M – 2	L – 2	L/M – 2	**L – 10**

Recommended mitigation measures include:

- Restricting mining and equipment operating hours to daytime hours (typically 07:00 to 17:00 on weekdays), unless otherwise approved.
- Providing workers operating in close proximity to machinery with appropriate hearing protection (earplugs or earmuffs).
- Maintaining all machinery in good working order to minimise unnecessary noise generation.
- Siting noisy operations as far as practicable from residential areas.

7.3.8 Waste Generation

Sand mining operations generate a variety of waste streams, including domestic litter from workers, used packaging, and hazardous waste in the form of used oils, lubricants, and fuel containers. If not properly managed, waste materials may be buried on-site, dispersed by wind, or result in soil and water contamination. Unsecured waste can attract pests and vermin and

create health hazards for workers and surrounding communities. Without mitigation measures in place, the impact of improper waste management and pollution from sand mining, would be rated as medium significance. However, by implementing the mitigation measures, the impact can be reduced to low significance

Table 17: Assessment of waste generation impacts from sand mining

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	M – 3	M/H – 4	M – 6	M – 3	**M – 39**
Post-Mitigation	L – 1	L – 1	L – 2	L/M – 2	**L – 8**

Recommended mitigation measures include:

- Providing adequate, clearly labelled waste containers at all operational areas and campsites.
- Disposing of all solid waste at the nearest approved waste disposal facility on a regular basis.
- Storing hazardous waste (used oil and fuel) in sealed, approved containers in a designated bunded area and disposing of it at an approved hazardous waste facility.
- Prohibiting the burning of waste on-site.
- Conducting regular waste audits to ensure compliance with the waste management plan.

7.3.9 Archaeological and Cultural Heritage Impact

Excavation activities have the potential to inadvertently expose and damage subsurface archaeological objects, graves, or sites of cultural significance. No formally registered heritage sites or known cultural resources within or immediately adjacent to the project area were identified during the scoping process. However, the absence of recorded heritage resources does not preclude the possibility of discovering previously unknown cultural material during excavation. This impact can be rated medium to low, if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be low.

Table 18: Assessment of the impacts of sand mining on archaeological and cultural heritage sites

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre-Mitigation	M – 3	M – 3	M – 6	M – 3	**M – 36**
Post-Mitigation	L/M – 2	L/M – 2	L/M – 4	L/M – 2	**L – 16**

Recommended mitigation measures include:

- Consulting with the National Heritage Council of Namibia prior to the commencement of operations.
- Training all on-site personnel to recognize potential archaeological finds or cultural materials.
- Implementing a “chance finds” procedure: if any archaeological material, artefact, grave, or human remains are discovered during excavation, all work in the affected area must cease immediately and the National Heritage Council and DEAF must be notified without delay.
- Resuming operations in the affected area only with the written approval of the relevant authority.

8 RECOMMENDATIONS AND CONCLUSIONS

The potential environmental and socio-economic impacts of the proposed sand and aggregate quarrying operation at the Emono Borrow Pit, Okatana Constituency, Oshana Region, have been systematically identified, assessed, and addressed in this Environmental Scoping Assessment Report. The following conclusions and recommendations are made:

- All identified potential negative impacts were rated as medium significance prior to mitigation. With the consistent and effective implementation of the recommended mitigation measures detailed in Section 7, all impacts are expected to be reduced to low significance.
- The concerns raised by I&APs during the public participation process have been carefully considered and addressed through the recommended management measures. Notably, the community’s request for a perimeter fence has been incorporated as a priority pre-commencement requirement in the Environmental Management Plan.
- The Proponent, or their appointed Environmental Control Officer (ECO), is required to actively monitor the implementation of all mitigation and management measures throughout the project lifecycle, and to report on compliance as required by the conditions of the Environmental Clearance Certificate.
- A comprehensive Environmental Management Plan (EMP) has been prepared. The EMP details the specific management actions, responsibilities, and monitoring requirements for each identified impact.

- The project is expected to deliver meaningful positive socio-economic benefits to Emono Village and the wider Okatana Constituency, including direct employment, skills transfer, support for local businesses, and improved access to affordable construction materials.

Subject to the granting of an Environmental Clearance Certificate by the Ministry of Environment, Forestry and Tourism, and the full implementation of the Environmental Management Plan, the proposed Emono Borrow Pit sand and aggregate quarrying operation is considered environmentally acceptable and is recommended for approval.

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DISCLAIMER

Malta Environmental Consulting Solutions cc confirms that the findings and conclusions presented in this report have been prepared in accordance with the methodologies outlined in the approved Scope of Work and the Environmental Management Act No. 7 of 2007, consistent with accepted professional practice for Environmental Scoping Assessments. Notwithstanding the diligent application of these methodologies, it is acknowledged that certain environmental conditions may exist on the subject property that were either not identified or could not reasonably have been identified within the scope of this assessment or from the information available at the time of evaluation.

While Malta Environmental Consulting Solutions cc has endeavored to ensure the reliability of all information gathered through record reviews and public consultation processes, the firm cannot warrant or guarantee the accuracy, completeness, or currency of information obtained from third-party sources. Accordingly, the conclusions and findings contained herein are strictly limited to the conditions and circumstances prevailing at the date of assessment. No additional warranties, whether express or implied, are made beyond those explicitly stated in this report.

It should further be noted that portions of this report are informed by personal interviews, field observations, and a review of available documents, records, and spatial data held by relevant government authorities and private entities. As such, this report is inherently subject to the limitations associated with historical documentation, the availability and accuracy of pertinent records, and the recollections of individuals consulted during the assessment process