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Environmental Impact Assessment (EIA) Study: Report

The Proposed Dune Sand Collection Activities within the Tses Village Council Jurisdiction of the ǁKharas Region - Application for Environmental Clearance Certificate (ECC)

ECC Application No.: **APP-007179**

Document Version: **Final for Submission to the MEFT**

Proponent: **Tses Village Council**

April 2026

Declaration of authorship

APPLICATION NUMBER: 007179

Project Title:

The Proposed Dune Sand Abketion Activities within the Tses Village Council Jurisdiction of the //Kharas Region.

I Fredrika Shagama (full name of Environmental Assessment Practitioner - EAP) understand and agree that the information I have furnished in this submission will be reviewed by the Office of the Environmental Commissioner (OEC). I accept that the Environmental Commissioner, will hold me accountable in terms of Section 43(1)(b) of the Environmental Management Act, Act No. 7 of 2007 for any inaccurate or misleading information knowingly provided in the following documentation.

Tick the box (es) applicable to your submission:

- ☐ Pro Forma Environmental Contract for Mining Claim(s)
- ☐ Environmental Questionnaire For Mining
- ☑ Scoping report
- ☐ Environmental Impact Assessment (EIA)
- ☑ Environmental Management Plan (EMP),
- ☑ Consent from Relevant Authority

I certify, and, acknowledge that the provision of such information will impede the lawful carrying out of the duties, responsibilities and functions of the Environmental Commissioner. I declare that the information submitted is my own work. All direct or indirect sources used are acknowledged as references.

Consultancy Name: Serja HGE Consultants CC

EAP Signature: FShagama

Date: 21/04/2026

NB- To be submitted jointly with Scoping Report, EIA, EMP documents to the Office of the Environmental Commissioner

DOCUMENT INFORMATION

Title: Environmental Impact Assessment (EIA) Study: Proposed Dune Sand Collection Activities within the Tses Village Council Jurisdiction of the ǁKharas Region – Application for an ECC

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SERJA'S STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the EIA Study for the Proposed Dune Sand Collection Activities within the Tses Village Council Jurisdiction of the ǁKharas Region, Serja Hydrogeo-Environmental Consultants declare that we:

- do not have, to our knowledge, any information or relationship with the Tses Village Council (*the Proponent*) nor the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) that may reasonably have the potential to influence the outcome of this Environmental Assessment and the subsequent Environmental Clearance Certificate (ECC) applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007, and its 2012 Environmental Impact Assessment (EIA) Regulation, as well as other relevant national and international legislation, guidelines, policies, and standards that govern the project activities as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings, or some of these may not be favourable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines, and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the project activities, other than remuneration (professional fees) for work performed to conduct the EIA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

Disclaimer: Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.

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Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: April 2026

EXECUTIVE SUMMARY

Due to the growing demand for suitable construction and other industrial materials to support regional infrastructure development, including road and railway projects, the Tses Village Council proposes to extract (collect) and supply dune sand from its jurisdiction at the site located about 1.7km south of the Village Centre (approximate GPS coordinates: -25.897748, 18.118933). The collected dune sand from the Tses Village site will be supplied to the construction industry and other industries (consumers) in the ǁKharas Region.

Project Activities

The main activities will entail fencing the sand collection (extraction) area with a mesh fence around the project site to restrict unauthorized public access and, for safety reasons, prevent community children from playing with mining equipment or in the sand pits.

Once the site is secured for regulated mining, the extraction of sand will commence by the Proponent and or their contracted operator (Sand Extraction/Mining Contractor). Mining and extraction will only be done by hauling and loading the dune sand into designated trucks for transport to consumers.

There will also be a setup of project infrastructure, including equipment storage and vehicle parking areas on-site. It should be noted that the site is not a greenfield, because there has been some dune sand collection done on-site before.

The Dune Sand Mining Process

The dune sand collection (mining) will entail the following:

- Sand removal using front-end loaders and excavators.
- Extraction methods, such as surface scraping (removing top layers of loose sand) and bench excavation (controlled cutting of dune slopes).
- Avoiding over-steepening dunes to reduce collapse and erosion.

Site Preparation

The dune sand mining process will commence with demarcating the selected and approved area (avoiding sensitive habitats). This will entail the establishment of buffer zones (from infrastructure). Furthermore, there will be minimal clearing of vegetation within the targeted site footprint only. This will entail leaving a limited area for the storage of project equipment and erecting structures such as shade for site personnel (such as a security guard), fencing of the site, and installation of a site ablution facility (2 toilets), as well as the security gate and signage at the site. There will be no need for the construction of an access road, because there are already two existing sandy single-track access roads to the site (from the Village and from the B1). There will be a need to install or set up stormwater diversion berms (shallow ditches) to divert rainwater away from the site during rainy seasons.

Once the site is cleared (in phases), the topsoil will be stripped and stored separately on-site to be used for rehabilitation.

Controlled Mining (Excavation)

To ensure that the mining activities are done in an environmentally and socially responsible manner, the method to be used to collect the dune sand will be as follows:

- Shallow, wide-area excavation (borrow pit method) **at the maximum depth between 2.5 and 3m in a lateral expansion way, to avoid excavating a deep pit. This is also because shallower mining pits are easy to rehabilitate and allow natural infilling by wind-blown sand, particularly for an area like Tses.**
- Strip sand in layers (benching approach).
- Material Selection: Target clean, well-sorted dune sand (free of organic material), and void mixing with subsoil layers.

Loading and Transport

The mined sand will be loaded onto tipper trucks/haul trucks with an excavator and transported to railway construction sites, other projects in the area/region, or stockpile areas. The dune sand loads will be covered to prevent the sand from being blown from the trucks or spilled on public roads during transportation, and water will be sprayed on the sand on-site during windy conditions (to minimize/avoid dust generation). Haul routes will be well planned and used to minimise dust and disturbance.

Stockpiling

The collected dune sand will be temporarily stored in stockpile areas, either on-site close to the extraction site (within the site premises) or near the final sand-required sites, such as railway works or other purposes in the region. The stockpiles will be kept as low-profile to reduce wind erosion.

Progressive Rehabilitation

Progressive rehabilitation is crucial in reducing long-term environmental damage. Hence, the disturbed dunes will be reshaped to a natural profile using the stockpiled topsoil that was put aside during site preparation (stripping), while avoiding steep slopes (to reduce erosion risk). Where feasible, the surfaces will be stabilized using brush packing and or natural regeneration.

Site Closure and Final Rehabilitation

Once the project activities are completed (owing to depleted desired dune sand material on-site), infrastructure and waste will be removed from the site. The vegetation on and around the site will be monitored for recovery (for instance, the dominant indigenous grass re-seeding (*Stipagrostis spp*. (lovegrass))). Therefore, the steps of final rehabilitation are as follows (in order of appearance):

1. Backfill of the pit (where feasible)
2. Re-contour to mimic natural dune surface
3. Spread the remaining topsoil (from progressive rehabilitation stage)
4. Re-vegetate with native species (re-seeding with *Stipagrostis spp* and others, where possible)
5. Remove the infrastructure, waste, and equipment.

Post-Closure Monitoring

Once closure and final rehabilitation are done, there will be monitoring for erosion, vegetation establishment, and illegal access to the site.

Anticipated Resources and Services Infrastructure

Human resources

The project will potentially employ about 7 to 15 local people (depending on the project's needs). Locals will be prioritised for employment (semi-skilled to unskilled labour). The workforce will comprise machine operators, labourers, security guards, etc.

Workers' accommodation

Workers will be commuting to the project site from their homes in Tses village to the work site. The skilled project workforce that is from outside the area will be accommodated in established accommodation facilities in Tses or in the nearby areas.

Site Accessibility

The project site can be accessed either from the B1 road via an existing sandy single-track or from the Tses Village Centre via the existing sandy single-track road.

Vehicles and equipment

The project equipment, machinery, and vehicles will be stored in designated areas inside the site premises. Machinery and vehicles such as excavators, dump trucks, bulldozers, loaders, support vehicles (such as 4x4 wheel-drive cars and other maintenance vehicles), etc., will also be parked at designated areas on-site.

Water supply

The water supply for the project will be supplied from the Tses Village Council water supply system. The water will likely be stored in a water storage tank on-site, to be used for the project (drinking) and dust suppression. To preserve fresh water resources, semi-treated water (if available) will be used for dust suppression.

Fuel supply

Diesel will be used for machinery and equipment, and a fuel generator to ensure an uninterrupted fuel supply to the project. Therefore, a 23,000-litre tank or a less-bunded fuel tank is anticipated for the site to ensure an uninterrupted supply during the project activities. The base of the tank will be lined with the impermeable Polyvinyl chloride (PVC) material under a concrete layer to prevent accidental oil spills from infiltrating the soil and groundwater. There will be oil spill control measures onsite, i.e., the absorbent material contained in the fuel spill equipment (such as a natural sponge-like material) that can absorb accidental fuel spillage or leaks. It is anticipated that the fuel tank will be refilled once a week. The Village Council will apply for a consumer installation certificate for the tank from the Ministry of Industries, Mines, and Energy (MIME).

Occupational health and safety

All project workers will be supplied with appropriate and adequate personal protective equipment (PPE) while carrying out project activities on-site. The site will also be equipped with a fully furnished first aid kit.

Site Security

The site will be fenced off using a mesh wire. The fencing will serve both as protection of the site from potential vandalism and theft of project equipment and infrastructure, and as a means of preventing unauthorized public access. Thus, protecting the vulnerable community members, such as unsuspecting children, from falling into the pit, and playing with the dangerous project equipment, as well as preventing local animals from entering the site.

Accidental fire outbreaks

The site vehicles and machinery will be equipped with fire extinguishers in case of accidental fire outbreaks. Therefore, a minimum of two fire extinguishers will be on-site.

Waste management (solid waste)

All waste generated from the project activities will be sorted, stored on-site in designated waste containers, and transported to the approved solid waste dumping site in Tses (for solid/domestic waste only).

Human waste/sanitation

Given the site distance from the Village centre (where proper toilets are and convenience purposes), the Tses Village Council will install at least two portable toilets for the workers and project-related visitors at the site. The toilets will be emptied according to the manufacturer’s instructions and as regularly as deemed necessary.

Hazardous waste (fuels)

Hazardous waste (such as fuels and oils) that may be used on-site will be properly contained in designated waste containers on-site for disposal at the approved hazardous waste facility in Windhoek. Therefore, no hazardous waste will be disposed of in the project area or any other unapproved waste management facility in the project area or the ǁKharas Region at large.

Decommissioning and Rehabilitation of the Site

Once the dune sand mining is completed (due to low demand or depletion of the resource), the project infrastructure will be dismantled. The site (borrow pit) will be rehabilitated in accordance with environmental regulations, usually by reshaping (levelling, as much as possible) and re-vegetating. Topsoil is replaced, and disturbed areas are stabilized to prevent erosion and encourage natural regrowth, ensuring long-term environmental sustainability.

Decommissioning and rehabilitation are primarily addressed through a decommissioning and rehabilitation plan that encompasses safety, health, environmental, and contingency aspects. Therefore, it is best practice for the Proponent to ensure the project and associated activities are ceased in an environmentally friendly manner, and sites are rehabilitated by carrying out the following:

- Dismantling and removal of all associated infrastructures from the project site areas.
- Carrying away all project equipment and vehicles.
- Clean up of site working areas and transporting the recently generated waste to the nearby appropriate and approved waste management facility.

Further decommissioning and rehabilitation practice at the site will include:

- Backfilling of pits and trenches associated with the site.
- Closing of holes and trenches to ensure that they do not pose a risk to both people and animals in the area post-dune sand collection activities.
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left as close to their original state as possible.

Communication with I&APs and Means of Consultation Employed

Communication with I&APs about the project activities was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration, and shared with registered stakeholders / Interested and Affected parties (I&APs).

- A Stakeholders (I&AP) List was developed and updated as new I&APs register for the EIA. The BID was shared with the pre-identified key stakeholders.
- Project EIA notices were published in the following newspapers:
    - *Market Watch*: The notice appeared in the newspaper on the 7th and 14th of April 2026.
    - *Windhoek Observer*: The notice appeared in the newspapers on the 9th and 14th of April 2026. The consultation period ran from the 7th of April 2026 to the 8th of May 2026.
- EIA notices (posters) in English were prepared for printing and pasted in Tses.
- Consultation meeting: The EIA community consultation meeting was held in Tses Village (at the community hall) on the 7th of April 2026. The meetings were attended by nine (9), including two Environmental Assessment Practitioners from Serja HGE Consultants and seven (7) people from the local community (social activists) who also represent the Tses Community Development Committee (TCDC), including the community chairperson of the TCDC. The community attendees indicated that the meeting invitations were received as per the posters pasted around the Village. However, the meeting's poor attendance was attributed to the pension payout (senior and vulnerable citizens grant) in the Village on that day; hence, some people came and left the meeting. On the poor attendance, Mr. Simon Kooper (a member of the TCDC) indicated that they will convey the meeting proceedings to the community in a separate meeting that will be held with the community and provide them with feedback from the EIA consultation meeting, upon which a letter will be compiled and submitted to Serja HGE Consultants.

Concluding remark on stakeholder and public consultation: A few key comments and issues raised during the consultation meeting were significant, but they did not object to the project. These are summarized below

- Site (community) safety and security
- Visual impact
- The lack of the ECC
- The issue of dune sand's poor sales, and the records of sales over a long time
- Compliance with the relevant national and local legal framework
- Transparency and public/community trust
- Things for improvement should be addressed if the ECC is issued
- PPE provision to project workers
- Supporting the development as long as things are done properly and complying with laws

The comments and issues raised during the consultation period were significant; however, they were not objections that would hinder, halt, or terminate the project activities. The stakeholders and I&APs would like to see the implementation of management and mitigation measures to reduce the significance of impacts during project implementation and proper implementation with transparency and continued engagement between the Tses community and the Village Council throughout the project.

Potential identified positive and adverse (negative) impacts of the proposed project.

Positive impacts (benefits) of the dune sand mining (collection) operations

- Socio-economic development through job (employment) creation in the area for 7 to 15 local people. Job creation for the few people who will be working at the sand collection site. Thus, improving local socio-economic development through income generation for households
- Economic development through the provision of construction and other industrial materials to local and regional projects.
- Empowerment of local businesses: Procurement of local goods and services for the project activities by small and medium businesses in the area and Region will promote local entrepreneurship and empowerment, as well as local economic development (income generation).
- Natural resource management and sustainable land use through a regulated and managed mining practice using the Environmental Management Plan (EMP).
- New revenue stream for the Tses Village through sales of the sand to customers in different industries.

Potential environmental and social (adverse) impacts of dune sand collection (mining). The mitigation measures for these impacts are included in the EMP.

- Soil and water pollution: improper handling of waste may lead to pollution of surrounding soils and eventually water resources systems (through wastewater runoff and infiltration).
- Land use change: The conversion of the natural landscape into a borrow pit can permanently alter landscapes, affecting the aesthetic value of the area.
- Depletion of local groundwater table: excavation of sand mining sites may affect the local water table, leading to changes in groundwater levels.
- General environmental pollution through mishandling of project-related waste.
- Loss of biodiversity through the removal of vegetation that may be found within the target sites of the site.
- Vehicular traffic: potential increase in local traffic due to site activities.

- Potential habitat destruction due to excavations for material sourcing can lead to the destruction of natural habitats for local biodiversity, if a larger area is needed.
- Impact on air quality: dust and particulate matter generated during the sand excavation, hauling, and transportation can compromise air quality in the surrounding area.
- Noise associated with the movement of heavy machinery and trucks can disturb nearby locals and animals.
- Occupational and community health and safety: Improper handling of materials and equipment may cause health and safety risks to workers and locals.
- Archaeological or cultural heritage impact through the uncovering of unknown objects during excavation.

Some key potential positive and negative impacts were identified by the Environmental Consultant, based on issues raised by I&APs during the consultation period. The issues raised by I&APs were addressed and incorporated into this Report, whereby mitigation measures have been provided in the Environmental Management Plan (EMP) for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described and assessed. The potential negative impacts indicated a medium rating of significance. To minimize significance, the Proponent, their contractors (if any), and their workers implement appropriate management and mitigation measures to avoid and/or minimize their impact on the environmental and social components. The effective implementation of the recommended management and mitigation measures, accompanied by monitoring, will particularly reduce the significance of adverse impacts that cannot be completely avoided (from medium to low).

Recommendations and Conclusions

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required for the ECC application for the dune sand collection (mining) and associated activities.

Serja Consultants are confident that the potential negative impacts associated with the project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures, and by putting more effort and commitment into monitoring the implementation of these measures. It is therefore recommended that the project be granted an ECC, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses, and approvals for the activities are obtained as required. These include permits and licenses, and ensuring compliance with these specific legal requirements.

- Transparency in communication and continued engagement with the communities and or through their leaders (local leaders and representatives), and stakeholders should be maintained throughout the project cycle.
- The buffer zones around marked biological, physical, and socially sensitive sites (such as archaeological and cultural heritages; the cemetery and old water reservoir) should be respected, and no activity should be conducted inside the 50m buffer zones (boundaries).
- The Proponent, their project workers and contractors (if any) comply with the legal requirements governing their project and its associated activities, and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.
- Site areas where excavations were carried out and have ceased are rehabilitated, as far as practicable, to their pre-excavation state. This includes levelling stockpiled topsoil, backfilling trenches, and closing and capping project-associated holes and trenches.
- The EMP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer / Safety Officer), and audited by an Independent Environmental Consultant on a bi-annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF. This will be required by the Environmental Commissioner (as part of the ECC conditions).

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to reduce the significance of adverse impacts from medium to low, and eventually to negligible. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMP implementation will not only be done to ensure that the impact's significance is reducing and or maintaining a low significance rating, but also to ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

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Appendix F: Minutes from consultation meeting with stakeholders/interested & affected parties (community)

LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MAFWLR	Ministry of Agriculture, Fisheries, Water, and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MIME	Ministry of Industries, Mines and Energy
NHC	National Heritage Council (NHC) of Namibia
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride
Reg, S	Regulation, Section
TCDC	Tses Community Development Committee (a community representative group)
UNCCD	The United Nations Convention to Combat Desertification

GLOSSARY (KEY TERMS)

Term	Definition
Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	The part of the environment that does not originate with human activities (e.g., biological, physical, and chemical processes).
Borrow Pit	Literal pits are dug to provide fill material, such as sand and gravel, for construction projects.
Cumulative Impacts / Effects Assessment	Concerning an activity, it means the impact of an activity that 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.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal
Dune Sand	[1]A mound of loose sand grains that are piled up by wind movement. As the mound grows in circumference and height due to subsequent sand deposits, the mound becomes so heavy that it will collapse under its own weight to form a sand dune. Dune sand is very fine sand with a maximum particle size of 1.18 mm.
Ecological Processes	Processes that play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy, and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water, and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan (Draft EMP)	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environmental effects are to be mitigated, controlled, and monitored.

[1]https://study.com/academy/lesson/sand-dunes-structure-and-types.html

Term	Definition
Interested and Affected Party (I&AP)	Concerning the assessment of a listed activity, it includes - (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.
Fauna and Flora	The animals and plants found in an area.
Mitigate	Practical measures to reduce adverse impacts.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of an action on the affected environment
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Proponent	Organization (private or public sector) or individual intending to implement a development proposal. As defined in the Environmental Management Act, the Proponent is a person who proposes to undertake a listed activity. The Proponent in this case is the Tses Village Council.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult, or interact with stakeholders affected by the proposed/project activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of the site and surroundings, and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into a full EIA.
Significant 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

1 INTRODUCTION

1.1 Project Background and Location

Due to the growing demand for suitable construction and other industrial materials to support regional infrastructure development, including road and railway projects, the Tses Village Council proposes to extract (collect) and supply dune sand from its jurisdiction at the site located about 1.7km south of the Village Centre (approximate GPS coordinates: -25.897748, 18.118933). The locality maps are provided in Figure 1-1 and Figure 1-2. The collected dune sand from the Tses Village site will be supplied to the construction industry and other industries (consumers) in the ǁKharas Region.

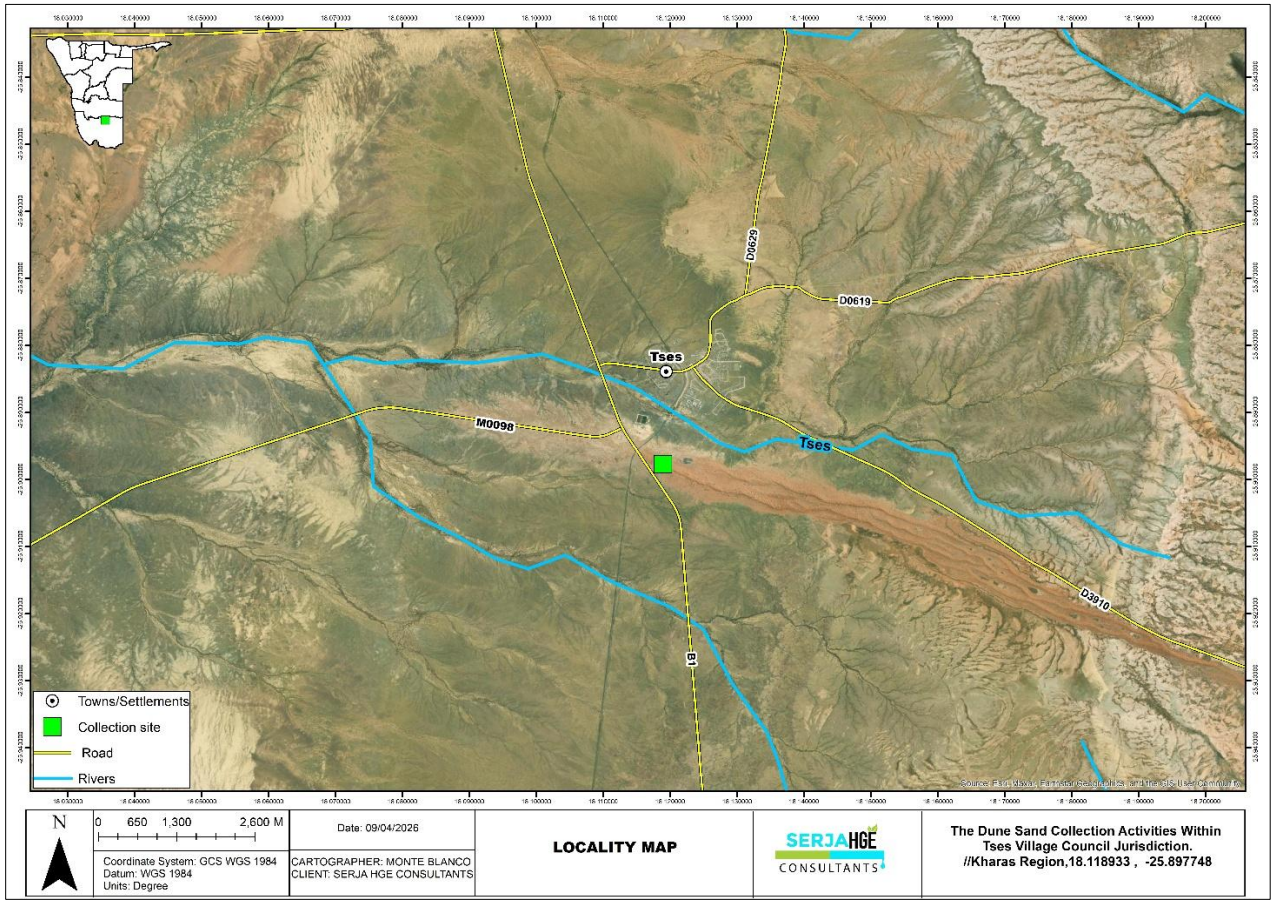


Figure 1-1: Locality map of the proposed dune sand collection in the Tses Village, ǁKharas Region

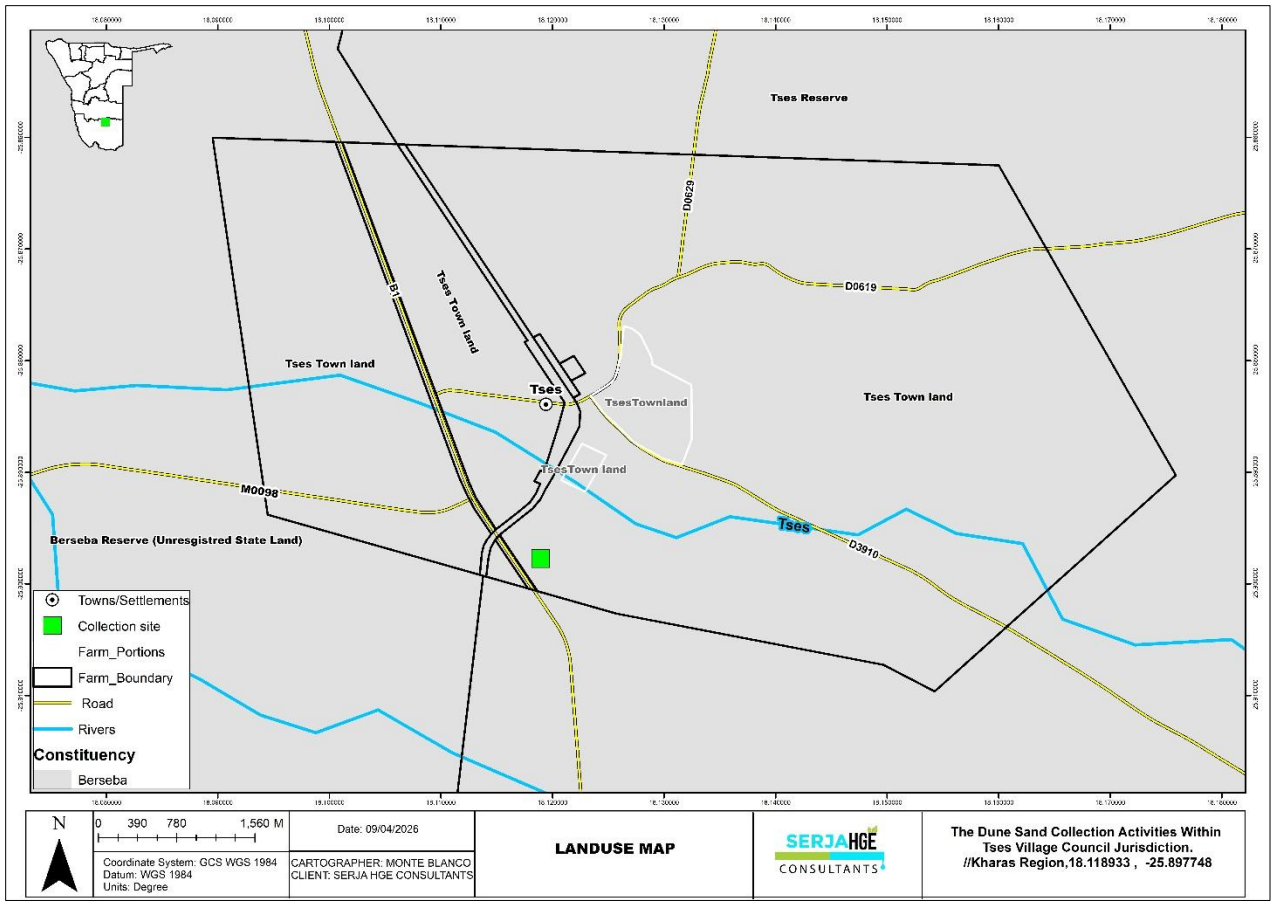


Figure 1-2: The land use (farm) map with the regional constituency in relation to the project site in Tses

1.2 The Need and Desirability of the Project Activities

The dune sand is needed to support the development of infrastructures and other industries in the //Kharas Region. Moreover, the dune sand, often referred to as fine sand or aeolian sand, is commonly used in specialized construction materials such as concrete, mortar, filler, etc. Obtaining dune sand from the local and regional sources will greatly reduce transportation costs, limit associated carbon emissions, and improve project efficiency. The proposed project will also present socio-economic benefits through job creation and opportunities for local contractors and suppliers. Thus, contributing to regional economic development. If properly managed and in line with environmental regulations and best practices, the operation can be undertaken sustainably with minimal long-term environmental impact.

1.3 Need for an Environmental Clearance Certificate (ECC)

The sand mining (extraction) and associated activities are listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Environmental Management Act (EMA) No. 7 of 2007 that may not be undertaken without an Environmental Clearance Certificate (ECC). The listed activities that are relevant to the proposed project activities are as follows:

Mining and quarrying activities for dune sand

Listed Activity 3. Mining and Quarrying Activities:

- *-Listed Activity 3.1 - The construction of facilities for any process or activities that require a licence, right, or other form of authorisation, and the renewal of a licence, right, or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Listed Activity 3.2: Other forms of mining or extraction of any natural resources, whether regulated by law or not, and Listed Activity 3.3: Resource extraction, manipulation, conservation, and related activities.*

The purpose of the EIA Study and subsequent issuance of the ECC is therefore to ensure that the project activities are undertaken in an environmentally & socially friendly and sustainable manner, through the effective implementation of recommended environmental management measures to minimize the adverse identified impacts while maximizing the positive impacts.

To comply with the EMA and its EIA Regulations and ensure environmental sustainability, the Proponent appointed Serja Hydrogeo-Environmental Consultants CC (Serja HGE Consultants), independent environmental consultants, to apply for the ECC on their behalf.

An application for the ECC was registered with the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) on the 17th of March 2026. Upon screening of this Background Information Document (BID), Serja Consultants has been required to prepare an Environmental Scoping Report and Environmental Management Plan (EMP) in an application for the ECC. The required documents (Scoping Report and EMP) will be submitted to the MEFTs for evaluation and consideration of the ECC.

1.4 Appointed Independent Environmental Consultant

To comply with the EMA and its Regulations and ensure environmental management, protection, and sustainability, the Tses Village Council appointed Serja Hydrogeo-Environmental Consultants CC, Independent Environmental Consultants, to apply for the ECC and conduct the required Environmental Assessment Process, which includes Public Consultation and prepare the EIA Report and EMP – Appendix A.

The EIA process (stakeholder / public consultation and engagement, including consultation meeting facilitation), compilation of the EIA Scoping, EMP, and associated documents was conducted and compiled by Ms. Fredrika Shagama. Ms. Shagama is a qualified and experienced Hydrogeologist and EAP, with over 10 years of experience in Groundwater and Environmental Management Consulting. Her CV is attached to this Report as Appendix B.

1.5 Application for the Environmental Clearance Certificate

The application for the ECC process was done as follows:

- Preparation of the Background Information Document (BID) for the project activities.
- Launching of the ECC application on the ECC Portal of the Ministry of Environment, Forestry and Tourism (MEFT) with the Proponent details (accompanied by the BID) for project registration purposes and obtaining a MEFT application/reference number (APP-007179).
- Completion of the ECC Form 1 (Section 32) of the EIA Regulations with the required project and Proponent information.
- Submission of the printed hard copy of the ECC application (with affixed NAD300 revenue stamps as application fees attached hereto) is submitted to the MEFT. The MEFT's date-stamped copy of the ECC application is uploaded on the ECC Portal as proof of application and payment.

The next component of the ECC application was to undertake an EIA process, which entails a Baseline Assessment of the Biophysical and Social environments, as well as public consultation and engagement. The findings of the EIA process are then incorporated into an EIA Report, and an EMP is also developed for the mitigation of potential adverse impacts anticipated from the project activities. The two documents and associated documents (appendices) are then submitted to the Environmental Commissioner at MEFT's Department of Environmental Affairs and Forestry (DEAF) for evaluation and consideration of the ECC.

1.6 Scope of Work and Report Contents

This Study has been conducted according to the EMA No. 7 of 2007, and its 2012 EIA Regulations, as mentioned in the preceding subsections, i.e., the project requires an ECC. Therefore, the process has been undertaken as required and guided by the Regulations.

This Report has been compiled as a required output of an environmental assessment process after the ECC application has been launched with MEFT. The Scoping Report, together with the EMP and all its appendices, will be submitted to the DEAF.

The document (report) covers the following chapters or sections, in addition to the introductory chapter:

- Project description and associated activities - (Chapter 2).
- Project alternatives considered (that were found to be environmentally friendly and technically feasible) - Chapter 3.
- The Legal requirements governing the project and its related activities, i.e., the legislation that the project activities must comply with (Chapter 4).
- The Environmental and Social Baseline of the project area - Chapter 5.
- The Public Consultation & Engagement Process undertaken to inform, invite, and engage the public (stakeholders and interested & affected parties) on the project activities - Chapter 6.
- The Assessment of identified potential impacts associated with the project activities (Chapter 7) - This chapter presents both the positive and negative (adverse) as well as cumulative impacts, assessment methodology, and the assessment of the negative impacts. The mitigation measures in the form of management action plans, with a timeframe and implementation responsibilities, are given in the EMP.
- The recommendations and conclusions of the environmental assessment are presented under Chapter 8. The data sources (literature/references) consulted for the assessment are listed under Chapter 9.

Based on the information provided by the Proponent and the EAP’s experience, a description of the project activities is presented in the next chapter.

2 DESCRIPTION OF THE PROJECT ACTIVITIES

The main activities will entail fencing the sand collection (extraction) area with a mesh fence around the project site to restrict unauthorized public access and, for safety reasons, prevent community children from playing with mining equipment or in the sand pits.

Once the site is secured for regulated mining, the extraction of sand will commence by the Proponent and or their contracted operator (Sand Extraction/Mining Contractor). Mining and extraction will only be done by hauling and loading the dune sand into designated trucks for transport to consumers.

There will also be a setup of project infrastructure, including equipment storage and vehicle parking areas on-site.

It should be noted that the site is not a greenfield, because there has been some dune sand collection done on-site before, as shown in some photos of the current condition of the site in Figure 2-1.

Figure 2-1: The current condition of the dune sand collection site in Tses on the 7th of April 2026

2.1 The Dune Sand Mining Process

The dune sand collection (mining) will entail the following:

- Sand removal using front-end loaders and excavators.
- Extraction methods, such as surface scraping (removing top layers of loose sand) and bench excavation (controlled cutting of dune slopes).
- Avoiding over-steepening dunes to reduce collapse and erosion.

2.1.1 Site Preparation

The dune sand mining process will commence with demarcating the selected and approved area (avoiding sensitive habitats). This will entail the establishment of buffer zones (from infrastructure). Furthermore, there will be minimal clearing of vegetation within the targeted site footprint only. This will entail leaving a limited area for the storage of project equipment and erecting structures such as shade for site personnel (such as a security guard), fencing of the site, and installation of a site ablution facility (2 toilets), as well as the security gate and signage at the site. There will be no need for the construction of an access road, because there are already two existing sandy single-track access roads to the site (from the Village and from the B1). There will be a need to install or set up stormwater diversion berms (shallow ditches) to divert rainwater away from the site during rainy seasons.

Once the site is cleared (in phases), the topsoil will be stripped and stored separately on-site to be used for rehabilitation.

2.1.2 Controlled Mining (Excavation)

To ensure that the mining activities are done in an environmentally and socially responsible manner, the method to be used to collect the dune sand will be as follows:

- Shallow, wide-area excavation (borrow pit method) **at the maximum depth between 2.5 and 3m in a lateral expansion way, to avoid excavating a deep pit. This is also because shallower mining pits are easy to rehabilitate and allow natural infilling by wind-blown sand, particularly for an area like Tses.**
- Strip sand in layers (benching approach).
- Material Selection: Target clean, well-sorted dune sand (free of organic material), and void mixing with subsoil layers.

2.1.3 Loading and Transport

The mined sand will be loaded onto tipper trucks/haul trucks with an excavator and transported to railway construction sites, other projects in the area/region, or stockpile areas. The dune sand loads will be covered to prevent the sand from being blown from the trucks or spilled on public roads during transportation, and water will be sprayed on the sand on-site during windy conditions (to minimize/avoid dust generation). Haul routes will be well planned and used to minimise dust and disturbance.

2.1.4 Stockpiling

The collected dune sand will be temporarily stored in stockpile areas, either on-site close to the extraction site (within the site premises) or near the final sand-required sites, such as railway works or other purposes in the region. The stockpiles will be kept as low-profile to reduce wind erosion.

2.1.5 Progressive Rehabilitation

Progressive rehabilitation is crucial in reducing long-term environmental damage. Hence, the disturbed dunes will be reshaped to a natural profile using the stockpiled topsoil that was put aside during site preparation (stripping), while avoiding steep slopes (to reduce erosion risk). Where feasible, the surfaces will be stabilized using brush packing and or natural regeneration.

2.1.6 Site Closure and Final Rehabilitation

Once the project activities are completed (owing to depleted desired dune sand material on-site), infrastructure and waste will be removed from the site. The vegetation on and around the site will be monitored for recovery (for instance, the dominant indigenous grass re-seeding (*Stipagrostis spp*. (lovegrass). Therefore, the steps of final rehabilitation are as follows (in order of appearance):

6. Backfill of the pit (where feasible)
7. Re-contour to mimic natural dune surface
8. Spread the remaining topsoil (from progressive rehabilitation stage)
9. Re-vegetate with native species (re-seeding with *Stipagrostis spp* and others, where possible)
10. Remove the infrastructure, waste, and equipment.

2.1.6.1 Post-Closure Monitoring

Once closure and final rehabilitation are done, there will be monitoring for erosion, vegetation establishment, and illegal access to the site.

The required resources and services that will be required for the dune sand mining activities will be provided by the Village Council throughout the project life cycle. These resources and service infrastructure are listed below.

2.1.7 Required Resources and Services Infrastructure

2.1.7.1 Human resources

The project will potentially employ about 7 to 15 local people (depending on the project's needs). Locals will be prioritised for employment (semi-skilled to unskilled labour). The workforce will comprise machine operators, labourers, security guards, etc.

2.1.7.2 Accommodation for workers

Workers will be commuting to the project site from their homes in Tses village to the work site. The skilled project workforce that is from outside the area will be accommodated in established accommodation facilities in Tses or in the nearby areas.

2.1.7.3 Site Accessibility

The project site can be accessed either from the B1 road via an existing sandy single-track or from the Tses Village Centre via the existing sandy single-track road.

2.1.7.4 Vehicles and equipment

The project equipment, machinery, and vehicles will be stored in designated areas inside the site premises. Machinery and vehicles such as excavators, dump trucks, bulldozers, loaders, support vehicles (such as 4x4 wheel-drive cars and other maintenance vehicles), etc., will also be parked at designated areas on-site.

2.1.7.5 Water supply

The water supply for the project will be supplied from the Tses Village Council water supply system. The water will likely be stored in a water storage tank on-site, to be used for the project (drinking) and dust suppression. To preserve fresh water resources, semi-treated water (if available) will be used for dust suppression.

2.1.7.6 Fuel supply

Diesel will be used for machinery and equipment, and a fuel generator to ensure an uninterrupted fuel supply to the project. Therefore, a 23,000-litre tank or a less-bunded fuel tank is anticipated for the site to ensure an uninterrupted supply during the project activities. The base of the tank will be lined with the impermeable Polyvinyl chloride (PVC) material under a concrete layer to prevent accidental oil spills from infiltrating the soil and groundwater. There will be oil spill control measures onsite, i.e., the absorbent material contained in the fuel spill equipment (such as a natural sponge-like material) that can absorb accidental fuel spillage or leaks. It is anticipated that the fuel tank will be refilled once a week. The Village Council will apply for a consumer installation certificate for the tank from the Ministry of Industries, Mines, and Energy (MIME).

2.1.7.7 Occupational health and safety

All project workers will be supplied with appropriate and adequate personal protective equipment (PPE) while carrying out project activities on-site. The site will also be equipped with a fully furnished first aid kit.

2.1.7.8 Site Security

The site will be fenced off using a mesh wire. The fencing will serve both as protection of the site from potential vandalism and theft of project equipment and infrastructure, and as a means of preventing unauthorized public access. Thus, protecting the vulnerable community members, such as unsuspecting children, from falling into the pit, and playing with the dangerous project equipment, as well as preventing local animals from entering the site.

2.1.7.9 Accidental fire outbreaks

The site vehicles and machinery will be equipped with fire extinguishers in case of accidental fire outbreaks. Therefore, a minimum of two fire extinguishers will be on-site.

2.1.7.10 Waste management (solid waste)

All waste generated from the project activities will be sorted, stored on-site in designated waste containers, and transported to the approved solid waste dumping site in Tses (for solid/domestic waste only).

2.1.7.11 Human waste/sanitation

Given the site distance from the Village centre (where proper toilets are and convenience purposes), the Tses Village Council will install at least two portable toilets for the workers and project-related visitors at the site. The toilets will be emptied according to the manufacturer's instructions and as regularly as deemed necessary.

2.1.7.12 Hazardous waste (fuels)

Hazardous waste (such as fuels and oils) that may be used on-site will be properly contained in designated waste containers on-site for disposal at the approved hazardous waste facility in Windhoek. Therefore, no hazardous waste will be disposed of in the project area or any other unapproved waste management facility in the project area or the ǁKharas Region at large.

2.2 Decommissioning and Rehabilitation of the Site

Once the dune sand mining is completed (due to low demand or depletion of the resource), the project infrastructure will be dismantled. The site (borrow pit) will be rehabilitated in accordance with environmental regulations, usually by reshaping (levelling, as much as possible) and re-vegetating. Topsoil is replaced, and disturbed areas are stabilized to prevent erosion and encourage natural regrowth, ensuring long-term environmental sustainability.

Decommissioning and rehabilitation are primarily addressed through a decommissioning and rehabilitation plan that encompasses safety, health, environmental, and contingency aspects. Therefore, it is best practice for the Proponent to ensure the project and associated activities are ceased in an environmentally friendly manner, and sites are rehabilitated by carrying out the following:

- Dismantling and removal of all associated infrastructures from the project site areas.
- Carrying away all project equipment and vehicles.

- Clean up of site working areas and transporting the recently generated waste to the nearby appropriate and approved waste management facility.

Further decommissioning and rehabilitation practice at the site will include:

- Backfilling of pits and trenches associated with the site.
- Closing of holes and trenches to ensure that they do not pose a risk to both people and animals in the area post-dune sand collection activities.
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left as close to their original state as possible.

The next chapter presents different and relevant alternatives considered for the project activities.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section will highlight the different ways the project can be undertaken and identify the most practical alternative, while minimizing environmental damage.

Once the alternatives have been established, these are examined by asking the following three questions:

- *What alternatives are technically and economically feasible?*
- *What are the environmental effects associated with the feasible alternatives?*
- *What is the rationale for selecting the preferred alternative?*

The alternatives considered for the project activities are presented below.

3.1 The "No-Go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the dune sand collection be discontinued, the site would remain as is. Consequently, there will be no sand excavation and sales to the relevant industries in the area and region. Moreover, none of the potential impacts (positive and negative) identified would occur. If the project activities are to be discontinued, the status quo of the land would remain unchanged. This option was considered, and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative was undertaken to establish what benefits might be lost if the project is not completed.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project.

3.2 Project Location)

The current site is specific due to the local geology. However, an alternative site was proposed by some members of the TCDC during the consultation meeting due to the potential visual impact. The alternative assessment is presented in Table 3-1 below.

Table 3-1: The assessment of dune sand collection sites considered for the project activities

Site A (Current/Brownfield)	**Site B (Towards the southeastern side of the village and between 2 rivers/greenfield)**	**Justification for the selected option**
The site falls within the Tses Village Council jurisdiction/boundaries	The site location in relation to the village boundaries could not be clearly established, but it seems like	Site A is confirmed to be within the Village Council boundaries, and not outside, which would put it under the jurisdiction of the

Site A (Current/Brownfield)	**Site B (Towards the southeastern side of the village and between 2 rivers/greenfield)**	**Justification for the selected option**
	it is outside the Village boundaries, or only a part of it falls within the boundaries	Regional Council and or the responsible Traditional Authority, and no longer under the Village Council, compared to Site B.
The site has a circular-like shape and will be so in the future.	The site has a linear-like shape, stretched over a distance.	Site A would be easier to fence off as a circular shape, compared to Site B.
There is no river crossing the site or close to it.	There is a mention of 2 rivers crossing paths with the site, or close to the site.	Site A is preferred. It is important to note that water bodies such as rivers are protected not only by the environmental laws, but also by the Water Resources Management (WRM) Act No. 11 of 2013, whereby Part 12 of the Act further requires a license to remove sand and or gravel and the amount of material that can be removed from water courses for sale or commercial exploitation purposes. Furthermore, Part 12: Section 141 of the WRM Act prohibits a person from removing rocks, sand, or gravel within 100 metres (100m) of the riparian zone from the stream or river bank. This means that most of the sand that will fall within the 100m buffer of the 2 rivers at a major part/area of Site B will be lost (prohibited), thus reducing the amount of dune sand that can be collected for the project and sold by the Tses Village Council.
The site is near the village cemetery with existing access roads and less vegetation cover.	The site is a greenfield with little to no disturbance, and existing services such as access roads.	The existing site (Site A) near the cemetery is already disturbed (due to previously collected sand); thus, it would be better to limit impacts at the existing site and cumulatively address them at the existing site. Site A also already has existing access roads to be used for the project.

Therefore, finding an alternative location for the dune sand other than the current (preferred) site is not feasible from an environmental, social, and economic perspective. Thus, the alternative site (Site B) has not made it through the alternative assessment criteria and considered factors.

3.3 Services Infrastructure

Alternatives were considered for different supporting infrastructures to ensure that the most feasible options were selected. The technological, economic, and environmental limitations were considered to select the most feasible option. The alternative considered in this regard is presented in Table 3-2 below.

Table 3-2: The presentation of service infrastructure alternatives considered for the project activities

Category of Infrastructure	Alternatives Considered	Justification for the selected option
Ablution facilities	-Install a fixed facility with a septic tank -Portable facilities with a septic tank	-To minimize rehabilitation costs and ensure good hygiene onsite, a flushing portable facility was selected as the best option for the workers who will be stationed on-site.
Water supply	-Bring water from the Village supply -Drill a new borehole for the project	-The water required onsite will be sourced from the Tses Village water supply scheme. A potable water storage tank on-site will be installed on-site and refilled as necessary throughout the project.
Fuel storage	-Trailer-mounted diesel tank -Fixed bunded fuel tank	-Given the fact that there is no fuel service station in Tses, as necessary for the project equipment and machinery on-site, a fixed bunded fuel tank will be installed on-site. The fuel will be dispensed under controlled conditions from one dedicated site for the project.
Power supply	-Diesel generator set, and if considered, solar power. -Powerline (grid) supply	-The actual dune sand mining does not require electricity, but equipment and machinery, such as generators, will use fuel (diesel). The workers will not need electricity on-site as they will be commuting from their homes in Tses, where there is already a power grid.
Offices, accommodation	-Erect dismantlable prefabricated units -Fixed structures	-Dismantable prefabricated units are favored due to: (a) Ease of installation, (b) Low installation costs, and (c) Ease of dismantling and moving.
Accommodation site	-Setting up a campsite -Commuting from towns -Commuting from home in the area	-No need for on-site accommodation (campsite) for workers, as the site is within the village, and workers (casual laborers and operators) from the Tses and surrounding communities will commute from their homes to the site.

The following chapter presents the national and international legal requirements applicable to the project.

4 APPLICABLE LEGAL FRAMEWORK

Some of the project's activities may be subject to certain legal policies. Therefore, it is necessary to review and consider this legislation and these legal requirements. These legal requirements are either local (institutional), national (Namibian), or international in scope, such as legislation, policies, guidelines, etc. The review of the relevant legal framework serves to inform the project Proponent, interested and affected parties, and the decision-makers at the DEAF of the requirements and expectations, as set out in these instruments, to be fulfilled to establish the project activities.

4.1 National Legal Framework: Laws, Policies, and Regulations

The national applicable legal framework and policies relevant to the project are presented in Table 4-1.

Table 4-1: List of applicable legislation for the project activities

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Constitution of the Republic of Namibia, 1990, as amended	The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include: "…the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at: "…Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State."	By implementing the environmental management plan, the establishment will comply with the constitution in terms of environmental management and sustainability. Ecological sustainability will be the project's main priority.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Environmental Assessment Policy of Namibia 1994	The policy provides a broad definition of the term "Environment," broadly interpreted to include biophysical, social, economic, cultural, historical, and political components, and references the inclusion of alternatives in all projects, policies, programmes, and plans.	This EIA outlines the environmental consequences of this project and considers the definition of the Environment.
Environmental Management Act No. 7 of 2007 and its 2012 EIA Regulations	The Act aims to ensure that the potential impacts of the development on the environment are considered carefully and in good time; that all interested and affected parties have a chance to participate in the environmental assessments and that the findings of the environmental assessments are fully considered before any decisions are made about activities which might affect the environment.	The Act aims to promote the sustainable management of the environment and the use of natural resources. The EMA is broad; it regulates land use development through environmental clearance certification and/or EIAs. The Act provides for the issuance of clearance certificates for mining activities associated with borrow pits.
The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the ǁKharas Regional Council (Berseba Constituency); therefore, they should be consulted.
Local Authority Act (Act No. 23 of 1992):	To provide for the determination, for purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties, and functions of local authority councils; and to provide for incidental matters.	The Tses Village Council, which is also the project proponent. Regardless, they should ensure that the Site activities follow the Act and its Regulations, as relevant to the project activities throughout the project life cycle.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Minerals (Prospecting and Mining) Act (No. 33 of 1992)	Section 52(1) mineral licence holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilised for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance. Section 54 requires a written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area. S91 requires that rehabilitation measures be included in an application for a mineral license	The Proponent should consult with the Office of the Mining Commissioner at MIME of any other required permits/authorization regarding sand mining within Townlands. The Contact person at the MIME Mrs. Isabella Chirchir: Mining Commissioner Tel: +264 61 284 8251.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess [sic] or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area."	The Proponent should obtain the necessary authorisation from the MIME if they intend to store fuel on-site. This entails the application of a consumer installation certificate.
Hazardous Substance Ordinance, No. 14 of 1974	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping, as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment.
National Solid Waste Management Strategy	The Strategy ensures that future directions, regulations, funding, and action plans to improve solid waste management are properly coordinated and consistent with national policy, and that co-operation between stakeholders is facilitated. Waste disposal is the main problem in Namibia's current solid waste management. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	The dune sand mining can generate solid waste (stockpiles and soil residue) that may require proper management to prevent pollution. Waste management plans should be generated and implemented on-site during project operations. The risk of solid waste to the environment and the surrounding areas of the project should be reduced.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Pollution Control and Waste Management Bill: Regulated under the MEFT	The bill aims to "prevent and regulate the discharge of pollutants to the air, water, and land." Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of, or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	The Proponent and their workers or contractors (if any) should continue with the good waste management work (directly or indirectly) to ensure that the waste does not cause environmental threats and degradation. **No permit or license required.**
Water Resources Management Act (No 11 of 2013) and its 2023 Water Regulations	The Act provides for the management, protection, development, use, and conservation of water resources; the regulation and monitoring of water services; and incidental matters. The objects of this Act are to: Ensure that the water resources of Namibia are managed, developed, used, conserved, and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii), which provides for preventing the contamination of the aquifer and water pollution control (Section 68).	The protection of water resources (both quality and quantity/abstraction) should be a priority.
National Heritage Act No. 27 of 2004	To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.	The Proponent should ensure compliance with the requirements of these Acts. The necessary management measures and related permitting requirements must be taken. This is done by consulting with the National Heritage Council of Namibia. A Chance Finds Procedure provided to the Draft EMP should be implemented upon discovery of archaeological and heritage resources.
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Soil Conservation Act (No 76 of 1969)	The Act provides for the prevention and control of soil erosion and the protection, improvement, and conservation of soil, vegetation, and water supply sources and resources, through directives issued by the Minister.	Duty of care must be applied to soil conservation, and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a dune or drifting sand or a gully unless the cutting, destruction or removal is done to stabilise the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	The Proponent should protect and conserve vegetation on and around the site. Should it become necessary to remove protected species such as the giraffe thorn and other listed protected trees under section 5.1.3 herein, a relevant permit under this Act to remove protected trees should be applied for and obtained from MEFT's Forestry Directorate.
Public Health Act (No. 36 of 1919)	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Public and Environmental Health Act No. 1 of 2015	The Act serves to protect the public from nuisance. It states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding the health and safety of labourers.	

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Atmospheric Pollution Prevention Ordinance (1976)	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for section 4(1) (a) of the ordinance.	The project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be implemented.
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; the control of traffic on public roads; the licensing of drivers; the registration and licensing of vehicles; the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	Mitigation measures should be provided if the roads and traffic impact cannot be avoided.
Labour Act (No. 6 of 1992)	The Ministry of Justice and Labour Relations is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety, and enhanced labour market services for the benefit of all Namibians. This ministry ensures the effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the project activities do not compromise the safety and welfare of workers.

4.2 International Policies, Principles, Standards, Treaties, and Conventions

4.2.1 Applicable International statutes (treaties and conventions) and policies

The other international statutes, such as policies, standards, and conventions that may govern the project activities, are provided under Table 4-2 below.

Table 4-2: Other international treaties and conventions governing the project activities

Statue	Relevant Provisions	Implications for the project / Requirements
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose of contributing to the conservation and sustainable use of biodiversity and the mitigation of climate change.	The project activities should not be undertaken in such a way that they contribute to desertification.

Statue	Relevant Provisions	Implications for the project / Requirements
	The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability.	
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity, whether within or outside protected areas, to ensure their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in their natural surroundings.	The removal of vegetation cover and destruction of natural habitats should be avoided, and where not possible, minimised.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992, and
- World Heritage Convention, 1972.

In addition to the project description, alternatives, and legal framework, it is important to note that the project activities are undertaken in a specific environment, with respect to biophysical and social factors. Therefore, understanding these existing environmental features before the project activities is crucial for assessing the potential impacts of the project activities on these features.

5 BIOPHYSICAL AND SOCIAL BASELINE

The dune sand mining and associated activities are undertaken in specific environmental and social conditions. Therefore, understanding the pre-project environmental conditions aids in describing the status quo versus future projections of environmental conditions once the project is implemented. The baseline information also aids in identifying the sensitive environmental features and how the best suitable management and mitigation measures can be recommended for implementation. The summary of selected biophysical and social baseline information about the project area is given below.

The baseline information presented below is sourced from a site visit (on the 7th of April 2026), online sources, including old reports, books, and publications, as well as other relevant research in the broader area. The project baseline that is deemed necessary for the project activities is as follows.

5.1 Biological Environment

5.1.1 Regional Fauna

The faunal community of the south and central Namibia is generally characterised by low species diversity. The fauna of the ǁKharas Region, in general, is as presented below (Shagama, 2021):

- Mammals: Common mammalian species expected to occur at and around the project site include Springbok (*Antidorcas marsupialis*), Kudu (*Tragelaphus strepsiceros*), Steenbok (*Raphicerus campestris*), Jackal (*Canis mesomelas*), Caracal (*Caracal caracal*), and Cape ground squirrel (*Xerus inauris*).

- Reptiles and amphibians: The overall reptile diversity in the general ǁKharas Region is estimated at between 41 and 50 species (Mendelsohn *et al*. 2002). The most important reptiles in the general Keetmanshoop area are viewed as those classified as vulnerable and protected game under Namibian legislation, these being the Leopard tortoise (*Stigmochelys pardalis*), Kalahari tent tortoise (*Psammobates oculiferus*), Bushmanland tent tortoise (*Psammobates tentorius verroxii*), Southern African python (*Python natalensis*), and rock monitor (*Varanus albigularis*).

- Birds: The wider area has approximately 93 avifauna species, of which 87 species are not associated with aquatic environments. Of these terrestrial species, 7 species are uncommon, 19 species are common, and the remaining 61 are common species. Many of the species identified are residents, with 79 species. There are 10 Endemic and 26 Near Endemic resident species occupying the Quarter Degree Square within which the site is located. The residents have 4 listed species, these being two (2) Near Threatened, and two (2) Vulnerable. The Vulnerable species identified within the area are the Kori Bustard (*Ardeotis kori*) and Martial Eagle (*Polemaetus bellicosus*).

5.1.2 Fauna

The project site is within the Tses Village Council jurisdiction, which is in a rural type of setup in the region. Therefore, the village and surrounding areas keep livestock such as cattle, donkeys, and small livestock (sheep and goats). Some hoof prints of donkeys and cattle were observed near the sand collection site, as can be seen in the photos in Figure 5-1. Extensive farming with small stock is the predominant, widespread rural economic activity in the region (Atlas of Namibia Team, 2022).

Figure 5-1: Cattle and donkey hoof prints observed at the access road close to the dune sand collection site

5.1.3 Flora

The Tses and broader area fall within the Nama Karoo biome, which covers most of the south-eastern part of Namibia and extends along the escarpment, making a transition zone between the savanna to the east and the desert to the west. Overall, there is a varied assemblage of plant communities within the biome, including shrubby vegetation and grasslands. The vegetation type in the area is that of Karas Dwarf Shrubland. On the plains, an open, tall shrubland with a relatively high grass cover is found. The total number of species is estimated to be around 259 (Shagama, 2021).

In terms of vegetation structure, the project area is characterised mainly by sparse shrubland - Figure 5-2.

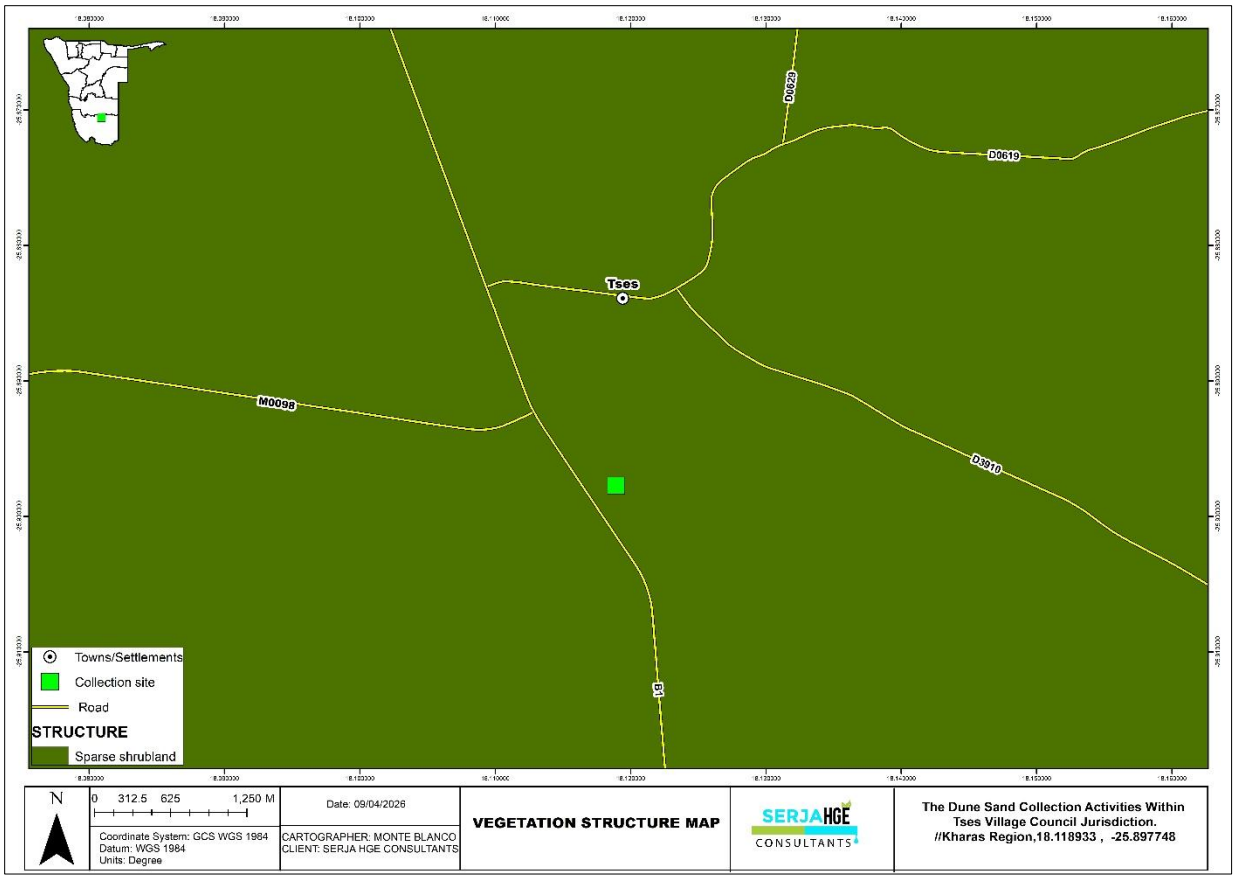


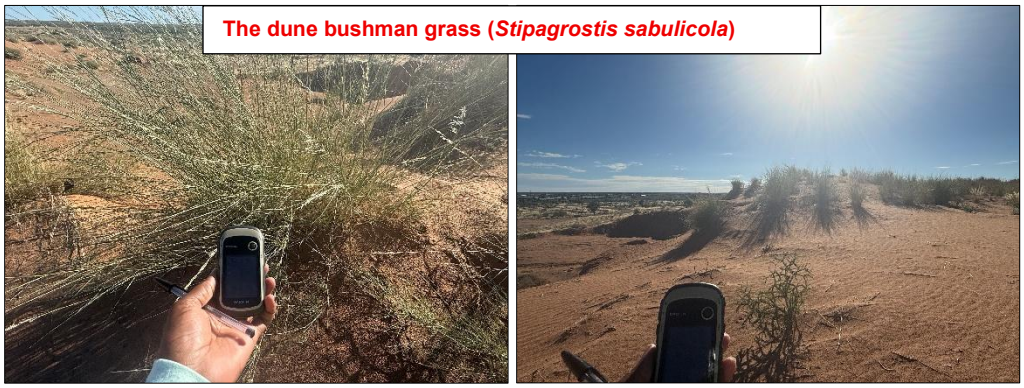
Figure 5-2: The vegetation structure map on and around the project site

The project site vegetation is low to moderately vegetated, and according to the Atlas of Namibia Team (2022), vegetation is sparse as a result of the arid climate. The dominating vegetation that is common on and around the site and in the general Tses area is as follows, as well as their protection status in terms of the Namibian Forestry Act No. Act 12 of 2001 and its Forest Regulations, 2015 (Government Notice 170 of 2015):

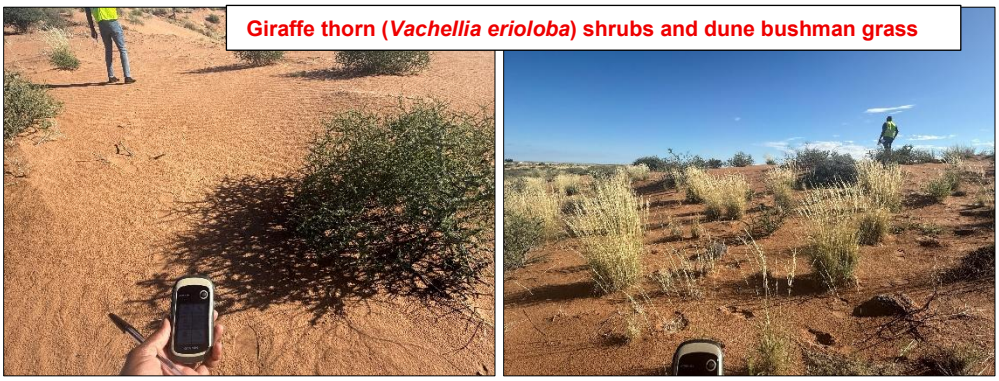
- **Black thorn (*Vachellia mellifera)* young trees and shrubs – Protected**
- **Red-bark acacia/red thorn (*Vachellia reficiens*) shrubs and young trees – Protected**
- **Giraffe thorn (*Vachellia erioloba)* young trees and shrubs – Protected**
- **Stink shepherd's tree (*Boscia foetida*) - Protected**
- Bitterbush (*Pechuel-Loeschea leubnitziae*) shrubs – not protected
- Three-thorn shrub (*Rhigozum trichotomum*) - not protected
- Shepherd's tree (*Boscia albitrunca*) - not protected
- Wild tamarisk (*Tamarix usneoides*) – not protected
- False ebony (*Euclea pseudebenus*) – not protected
- Karee tree (*Rhus lancea*) – not protected
- Green-hair tree (*Parkinsonia africana*) - not protected

- Honey mesquite (*Prosopis glandulosa*), the evergreen invasive species (not protected).

The project site area is a semi-arid to arid environment dominated by low shrubs, scattered trees, and hardy and tufted perennial grasses between shrubs, adapted to low rainfall. The common vegetation (mainly grass, shrubs, and young trees) observed on-site is shown in the photos in Figure 5-3. The common grass on and around the site is the dune bushman grass or sand dune grass (*Stipagrostis sabulicola*), with scarce lovegrass (*Eragrostis spp*.).



The dune bushman grass (*Stipagrostis sabulicola*)



Giraffe thorn (*Vachellia erioloba*) shrubs and dune bushman grass

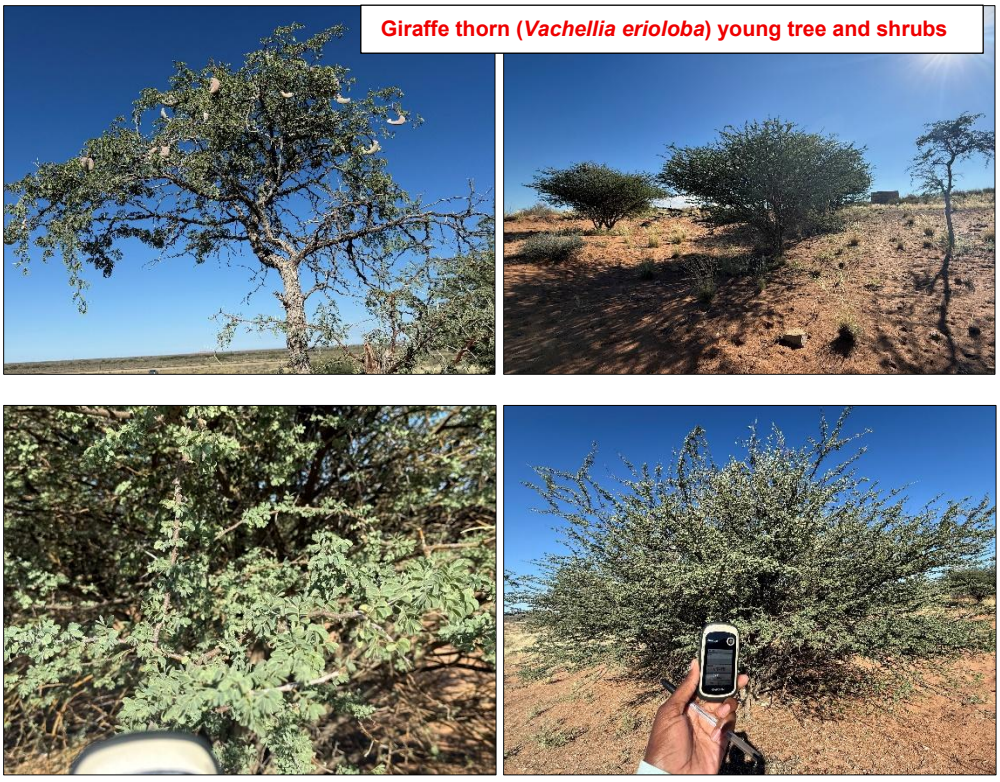


Figure 5-3: Photos of some vegetation observed near the site (to the south and southwest)

Apart from the scattered grass and smaller vegetation within the already disturbed centre areas of the site, there is one giraffe thorn tree (*Vachellia erioloba*) on the northwestern side, as shown in Figure 5-4. Therefore, since this tree species is protected by the Forestry Act**, it should not be removed. Thus, it MUST be left to preserve the already scarce vegetation in the area. Thus, the sand mining activities should avoid the giraffe thorn tree.**

Figure 5-4: The single young black thorn tree on the edge of the disturbed dune sand collection site

It should be noted that the vegetation is highly influenced by rainfall variability, grazing pressure, and the soil type (often stony/shallow).

5.2 Physical Environment

5.2.1 Climate

The baseline climatic conditions for Tses Village have been sourced from the World Weather Online website.

Temperature

The area experiences average low and high temperatures of 9ºC in July and 34ºC in December, respectively, as shown in Figure 5-5.

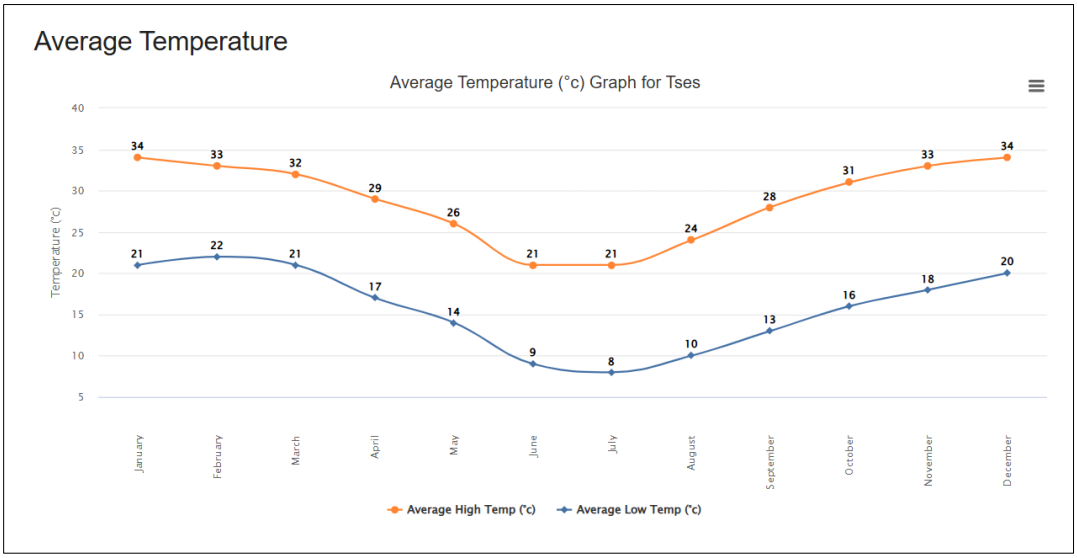


Figure 5-5: Average low and high temperature chart for the Tses area (source: World Weather Online, 2026)

Rainfall

The area experiences low annual rainfall ranging between 80 and 100mm between January and March, with the highest rainfall recorded at 100mm in 2011, 88mm in 2012, and 80mm in 2021 (World Weather Online, 2026). The highest average rainfall for the area is 50mm in February and 46mm in January, as shown on the chart in Figure 5-6.

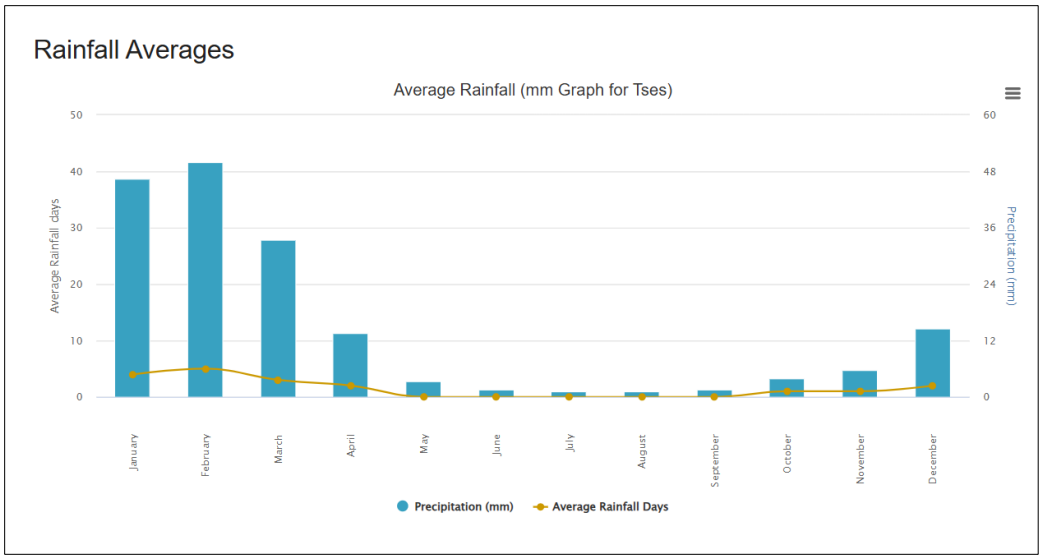


Figure 5-6: Average rainfall chart for the Tses area (source: World Weather Online, 2026)

5.2.2 Landscape and topography

The project area falls within the Nama-Karoo Basin, as shown on the map in Figure 5-7. This extensive, flat landscape dominates much of southern Namibia and is underlain by horizontal layers of sediments. One of the few breaks in the landscape is the well-known Brukkaros Mountain (also known as 'Geitsi Gubib'), an extrusion of igneous rock that rises some 650 metres above the surrounding plain. Sills of dolerite (dark volcanic rock) pushed through the sediments, especially around Keetmanshoop, and with weathering have given rise to the Giants' Playground setting. The iconic quiver tree or kokerboom (Aloe dichotoma) thrives on the rich soil produced from the dolerites (Atlas of Namibia Team, 2022).

Additionally, the major ephemeral rivers in the landscape are the Fish, Konkiep, and Löwen rivers, which flow southwards across this landscape towards the Orange River.

The project area is flat in some areas and hilly areas. The elevations range between 951 and 1,216 meters above sea level (masl), as shown on the topographic map in Figure 5-7 below. The landscape around Tses is typically: gently undulating plains, occasional low rocky outcrops, and ephemeral drainage lines (dry riverbeds). These features are controlled by differential weathering of sandstone and shale and are influenced by the arid climate processes.

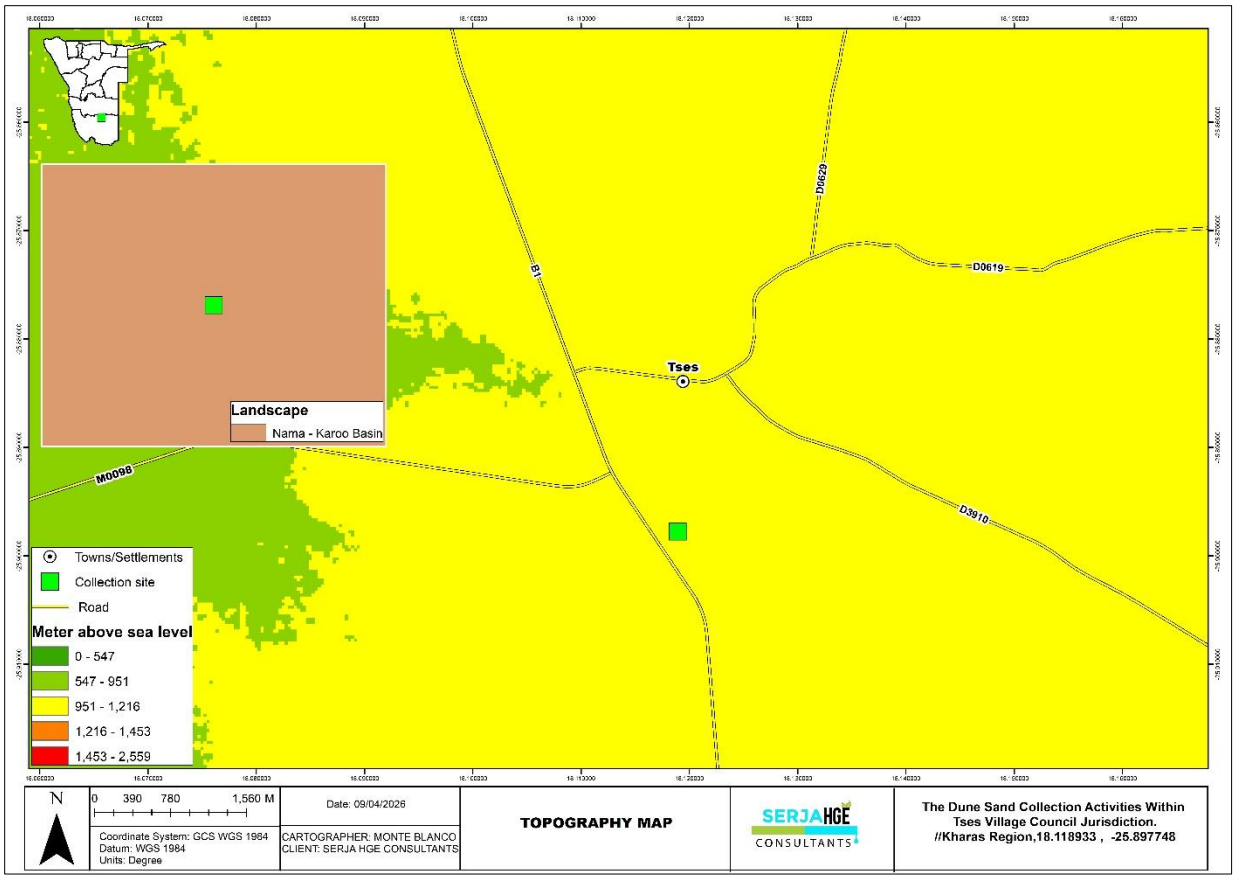


Figure 5-7: The topography and landscape of the area

5.2.3 Geology

The regional geology comprises the Kalahari Group sediments (sands and calcrete) to the northeast of Tses, and the western part of Tses is characterized by the sandstones and shales of the Nama Group.

The geology of Tses Village and the surrounding area is characterised by the sandstones and shales of the Karoo Supergroup (Sequence) of the Fish River Subgroup (Nama Group). The formations that underlie the Tses Village include gross Aub and Nababis, comprising red shale and red sandstone, locally greenish and red to purple sandstone, locally greenish, respectively (see the geological/stratigraphical explanation of the Tses area in Figure 5-8).

The site is underlain by sedimentary rocks of the Nama Group, dominated by quartzitic sandstones with interbedded shale and mudstone layers that were formed in shallow marine to fluvial (river) environments. Surface conditions are characterized by calcrete development and thin colluvial/alluvial soils. The terrain consists of gently undulating plains with ephemeral drainage features. These geological conditions are typical of arid southern Namibia and influence both soil stability and groundwater occurrence.

The Nama Group is subdivided as follows:

Group	Sub-group	Formation	Lithology
Nama	Fish River	Gross Aub	Red shale and red sandstone, locally greenish.
		Nababis	Red shale and red to purple sandstone, locally greenish.
		Breckhorn	Red to purple quartzitic sandstone and some subordinate red shale.
		Stockdale	Basal red to purple coarse grained quartzitic sandstone with thin conglomerate layer. Red friable sandstone, shale.
	Schwarz-rand	Vergesig	Green shale with green and red sandstone.
		Nomtsas	Reddish shale and reddish sandstone, becoming green south of Maltahöhe, with basal coarse conglomerate in many places, limestone towards the south-west.
		Urusis	Greenish shale and greenish sandstone (in the north), with dark blue limestone and black limestone inter-layered and intercalated (in the south).
		Nudaus	Green shale and greenish sandstone, grey to greenish quartzite.
	Kuibis	Zaris	Bluish-green shale, sandstone, pink and grey to black limestone.
		Dabis	Grey to white quartzite, some grey dolomitic limestone, grey to greenish quartzite.

Figure 5-8: The Geology (stratigraphy) of the Tses area (Christelis and Struckmeier, 2011)

According to Christelis and Struckmeier (2011), due to their predominantly horizontal bedding, rocks of the Nama Group tend to weather and erode in layers, resulting in flat plains, with major drainages forming canyons and gorges. Erosion produces rock fragments or clay-size particles, and rivers accumulate very little sandy alluvium.

The site surface is overlain by loose materials/sediments of sand, gravel, and silty soils that overlie the bedrock (comprising rock units of tillite, boulder shale, sandstone, and limestone), as shown on the site geology map in Figure 5-9.

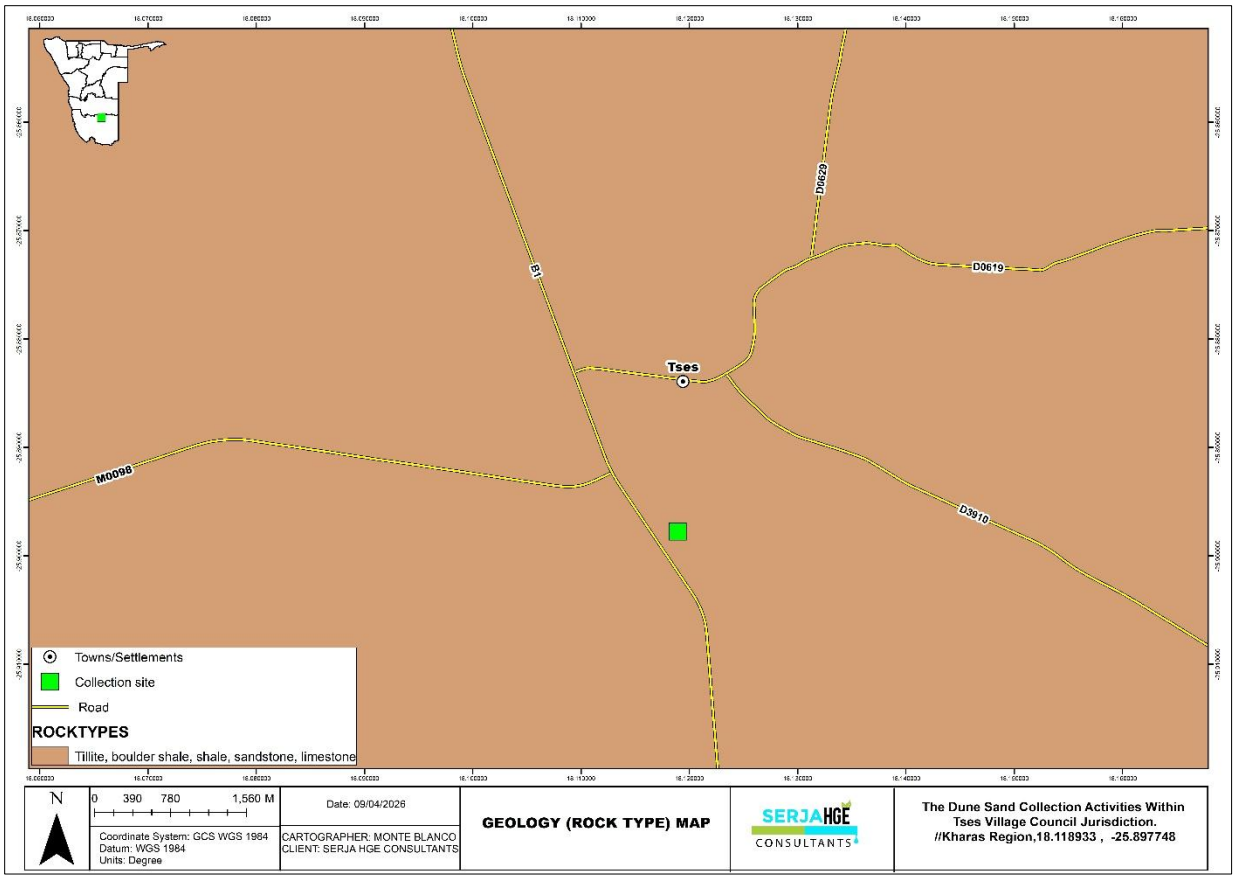


Figure 5-9: The geology of the project site and surroundings

5.2.4 Soils

The dominant soil types in the area are eutric leptosols, as shown on the soil map in Figure 5-10. According to Mendelsohn et al (2002), eutric soils are fertile soils with high base saturation. Atlas of Namibia Team (2022) described that leptosols are extremely stony or very shallow soils over a continuous rock surface. They are prevalent in hilly areas where the rate of erosion exceeds the rate of soil formation or sediment accumulation. The thin soil layer and rapid drainage mean that Leptosols have low potential for crop production, thus the low crop productivity in most areas of the ǁKharas Region.

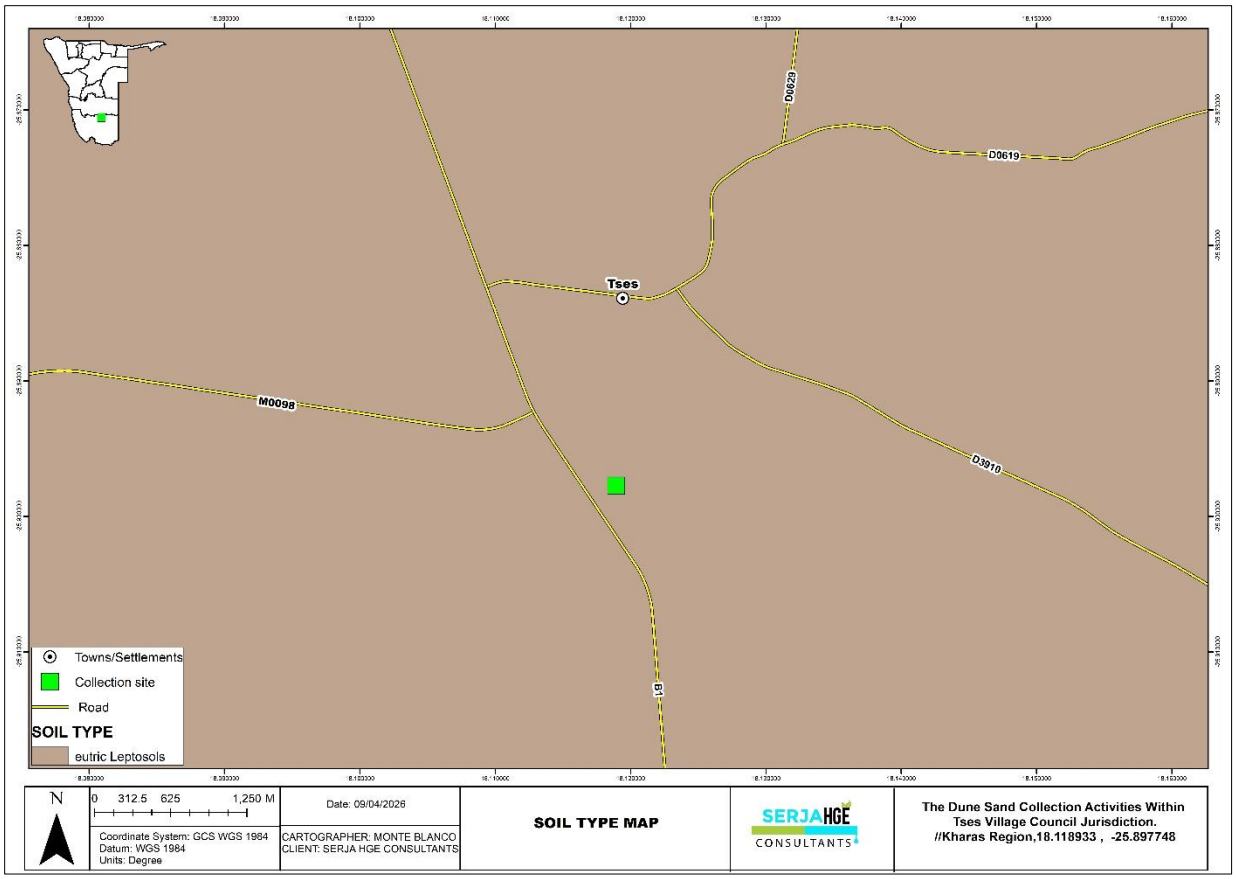


Figure 5-10: The dominant soil types on and around the site

Soils near and around the site are reddish-brown sand soils covered by grass - Figure 5-11.

Figure 5-11: The common reddish-brown soils on and around the site

5.2.5 Water Resources: Groundwater (Hydrogeology) and Surface Water (Hydrology)

In terms of hydrogeology, the Tses Village falls under the Fish River-Aroab groundwater basin. Most of the small towns, such as Aroab, Maltahohe, Kalkrand, Gibeon, Berseba, and Bethanie, rely on groundwater abstracted from aquifers in the Nama sediments. The landscape in the basin is extremely barren and rocky with little soil cover. The vegetation is mainly found in riverbeds (Lohe et al., 2021).

Rock types of the Nama Group are inherently impermeable with little or no primary porosity. Groundwater is hosted in secondary features like faults and joints in sedimentary rocks of clastic origin (sandstone, quartzite, and shale) and in solution features in limestones and dolomites. In the Hardap and ǁKharas Regions, water levels are generally shallow in the east, close to the course of the Fish River, but become progressively deeper towards the escarpment in the west, where water levels deeper than 200 m have been recorded (Lohe et al., 2021). Boreholes of moderate yield are drilled on fractures crossing river courses (Christelis and Struckmeier, 2011).

The geohydrology map of the project site and surrounding areas is shown on the map in Figure 5-12. The Tses area is characterized by aquifers with little groundwater potential. There are several boreholes in and near Tses that are mainly drilled along or in rivers, as indicated by Christelis and Struckmeier (2011) above.

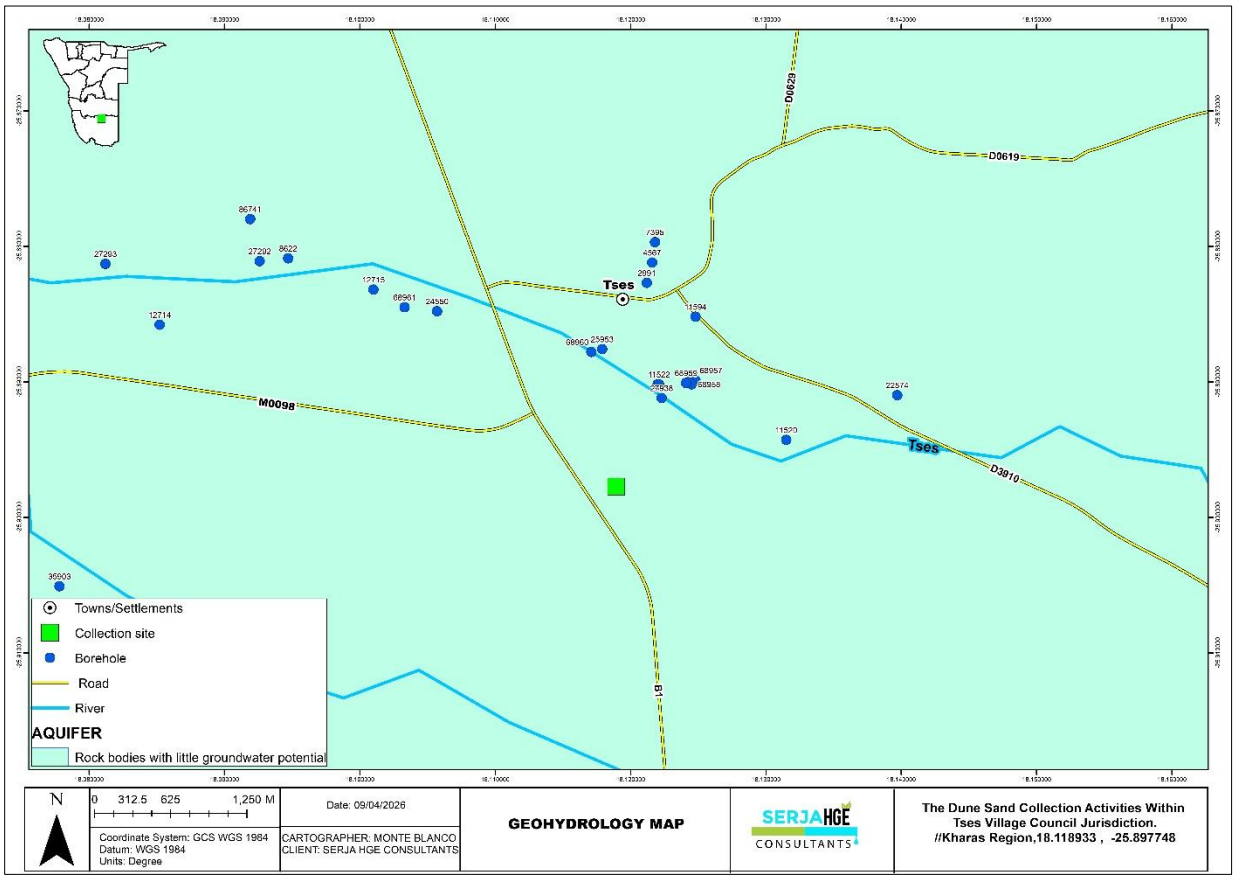


Figure 5-12: The surface and groundwater (geohydrology) map of the area

5.2.5.1 Hydrology and Catchments

On a regional scale, the wider area falls within the Orange River Catchment. The main surface water features near the project site are the ephemeral Fish River, Tses River, and several dry streams in and around the Tses Village. The Fish River flows in a southerly direction towards the Orange River (Shagama, 2021).

The project site was delineated by using ArcGIS. The digital elevation model was used as an input to enable the delineation of a drainage system and then to quantify the characteristics of that system. The tools in the extension allow the user to determine, for any location in a grid, the upslope area contributing to that point and the downslope path that would be followed by the water. This data is usually important during impact assessments. The catchment delineation for the project site is shown in Figure 5-13.

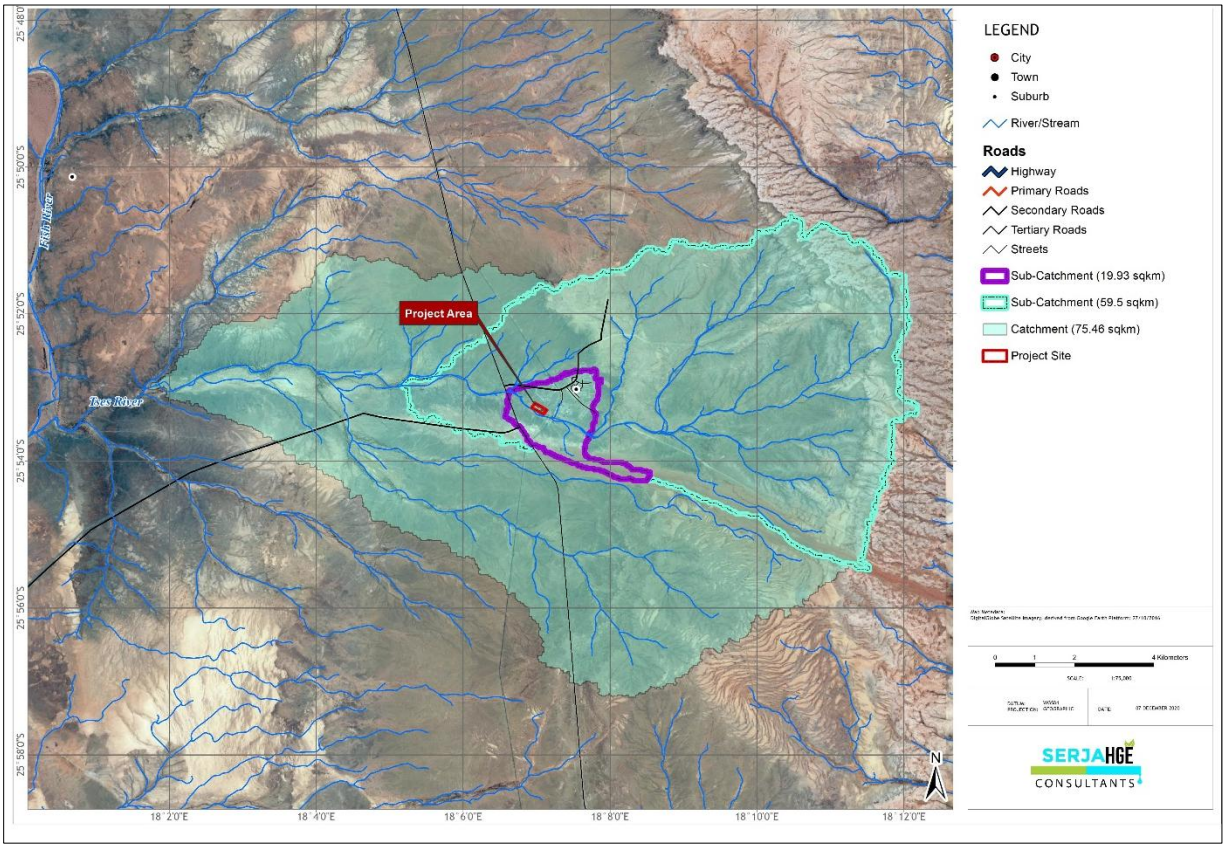


Figure 5-13: The sub catchment of the project site in Tses Village

5.2.5.2 Groundwater Quality

According to Earthwise Contributors (2020), there is little anthropogenic contamination of groundwater in general, but untreated wastewater in some communities causes degradation of quality. There are some cases of increased nitrate concentration linked to cattle farming, and some natural occurrences of elevated nitrate. The main groundwater quality problem is naturally high TDS and fluoride.

Groundwater that is currently considered safe for drinking will, in many cases, now be classed as sub-standard, particularly in smaller communities and rural areas. Water treatment will become increasingly necessary (Earthwise Contributors, 2020). The water quality of the regional aquifers is said to have deteriorated due to over-abstraction and lack of recharge, which could be linked to low rainfall received in the area (Christelis and Struckmeier, 2011) and continuing abstraction to supply the communities, resulting in little or no recharge and aquifer recovery, respectively

5.2.5.3 Surface and Groundwater Vulnerability to Pollution

With regards to surface water, potential pollution is likely if there is a high risk of accidental spills of hydrocarbons (oils or fuels) and effluent (wastewater) washed off into nearby surface water bodies, particularly during the rainy months of the year (January to March). The risk of water pollution would be high, as it will be difficult to control and manage the pollution flow that is worsened by surface runoff. In terms of groundwater vulnerability to pollution in the area, the area has a moderate vulnerability to pollution, as per the national groundwater vulnerability to pollution map in Figure 5-14. The moderate vulnerability of groundwater to pollution in the area could be explained by the consolidated rock units underlying the project site, which would otherwise provide ready and easy pathways for polluted water to flow in case of a pollutant.

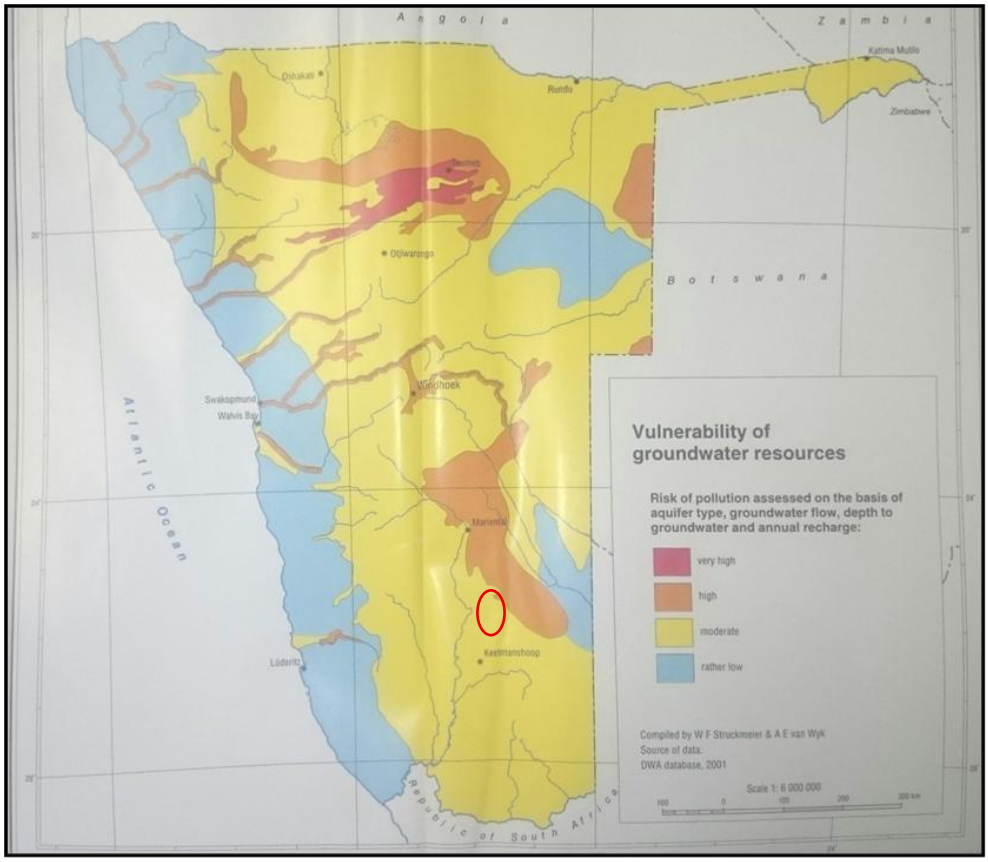


Figure 5-14: Vulnerability of groundwater resources to Pollution (Van Wyk et al., 2001)

5.3 Social and Economic Environment

5.3.1 Demography

According to the 2023 Population and Housing Census data, the ǁKharas Region has a total population of 109,893 as per the 2023 National Population and Housing Census. Of the total population, 55,670 were males and 54,223 females (Namibia Statistics Agency (NSA), 2024a), with a population density of 0.7 persons per square kilometer (km^2). The Tses Village falls in the Berseba Constituency, which has a population of 11,258 and a population density of 0.4 persons/km^2, respectively (NSA, 2024b).

The ǁKharas Region has a high literacy rate of 96.5%. The early childhood development (age 0 to 5) stands at 24.1%, while for the population of 15+ years of age, 3.5% have never attended school, 12.3% is the population that is currently in school, and 83.3% have left school (NSA, 2024a). Furthermore, NSA (2024a) indicates that the population of 3 years and above has access to the internet (37.6%), and the population that owns cellphones is at 61.3%.

5.3.2 Economic activities

According to the NSA (2024a), the main sources of income in households in the ǁKharas Region are farming (2.3%), wages and salaries (68.5%), old age pension (8.9%), and business, non-farming (3.9%).

The ǁKharas Region is characterized by extensive farming, with small stock being the predominant, widespread rural economic activity. The project site being in the Nama-Karoo Landscape, the significant irrigation schemes are associated with the Hardap and Naute dams (in the Hardap Region), and the third is planned for development at Neckartal Dam (in the ǁKharas Region). Thus, economic activities concentrated in towns, especially the larger regional centres of Mariental and Keetmanshoop, are mostly related to agriculture (Atlas of Namibia Team, 2022).

5.3.2.1 Agriculture, Mining, and Tourism

The ǁKharas Region is a predominantly small stock (sheep and goats) farming area. However, game and irrigation farming (at the Naute Dam and along the Orange River) have become increasingly important. The Naute Irrigation project is about 132 hectares in extent, with dates and grapes being the main products grown at the scheme. The upcoming irrigation scheme at the Neckartal Dam promises to add to the economic livelihood in the Region (Shagama, 2021).

Added to that, important mining operations in the Region include onshore diamond mining (Namdeb Diamond Corporation), offshore diamond mining (De Beers Marine Namibia and Sakawe Mining Corporation), zinc and lead concentrate (Rosh Pinah Zinc Corporation), and high-grade zinc (Skorpion Mining) (Shagama, 2021).

Regarding tourism in the Region, some of the places of attraction include: Hot Water Springs (Ai-Ais and Warmbad), the Kokerboom Forest (near Keetmanshoop), the Fish River Canyon (the second largest canyon in the world), Brukaros Mountain (near Berseba), the coastal town of Lűderitz (with fishing and boat building industries), and several guest and game farms. The Quiver Tree Resort, associated with the

Mesosaurus fossils, Giants Playground dolomitic features, the Quiver Trees of the area, and various hospitality service providers within and surrounding Keetmanshoop (Shagama, 2021).

5.4 Infrastructure and Services

The project site is in a village setup, but it has the basic services and infrastructure. Tses Village is found in the ǁKharas Region that is connected to the rest of the country by the B1 tarred road as well as good-graded gravel road links, health centres, educational institutions, shops (in towns and settlements), and hospitality facilities, etc. Some of these services are well-placed around the project site area and nearby areas.

The following services infrastructure has been observed near the site and for the general project area and Region:

- Water Supply: The general project area is supplied with freshwater by NamWater from the local water boreholes. According to the information provided by the Tses Village Council, there are currently six boreholes, four belonging to NamWater and two belonging to the Tses Village Council.
- Electricity: There is a NamPower substation that supplies power to the Tses Village and surrounding areas. The substation is on the southern side of the Tses Village between the School and the immediate NamWater and Village Council water boreholes.
- Roads (Accessibility): The project site can be accessed either from the B1 road via a sandy single-track or from the Tses Village Centre via the sandy single-track road – see Figure 5-15 for the sandy single-track access roads from the Tses Village and B1.

Figure 5-15: The sandy single-track access roads to the dune sand collection site

- Railway: A railway on the northeastern side of the site in Tses. The Region's capital town, Keetmanshoop, is an important national railway junction with a TransNamib Train Station, linking the town via Tses with the north of the country, to the west it links via Aus the coastal town Ludertz, and to the south-east it links via Grünau, Karasburg and Ariamsvlei to the neighbouring country, South Africa (ǁKharas Regional Council, 2020).

- Air transport: The Keetmanshoop airport facilities, which can accommodate long-distance aircraft, and there is a training venue for Namibia's only flying School (ǁKharas Regional Council, 2020).
- Telecommunication Services: The ǁKharas Region and the project site area are well connected to the rest of the country and world via local network service providers such as the Mobile Telecommunications Company (MTC Namibia), and in some instances, Telecom Namibia, as well as landlines in urban areas and in some rural residences, including villages such as Tses.
- Waste management: The proposed project site is in a rural setup, but with waste managed at an urban level. There is a waste management facility (landfill site) in Tses that is operated by the Village Council. The Tses Villages sewage is managed through four new oxidation ponds that were constructed in 2021.

5.5 Archaeology and Heritage Aspect

5.5.1 Local Perspective and Findings

The expected archaeological and cultural heritage resources in the broader area of the site are graves (marked and unmarked), artefacts, etc. In terms of locally known and recorded archaeological and cultural heritage sites, there is a village cemetery to the north-eastern side of the site (at the GPS coordinates: -25.896768, 18.120214) and an old water reservoir to the south of the project site (at these GPS coordinates: -25.898287, 18.119874).

These recorded archaeological sites during the site visit are shown on the map in Figure 5-16. Therefore, these surface archaeological sites should be protected during dune sand excavation. It is also recommended that the National Heritage Act, No. 27 of 2004, be strictly enforced, and that, concurrently, the recommendations in the statutory documents for this project be strictly adhered to, particularly for unknown and undiscovered subsurface sites of archaeological and cultural value.

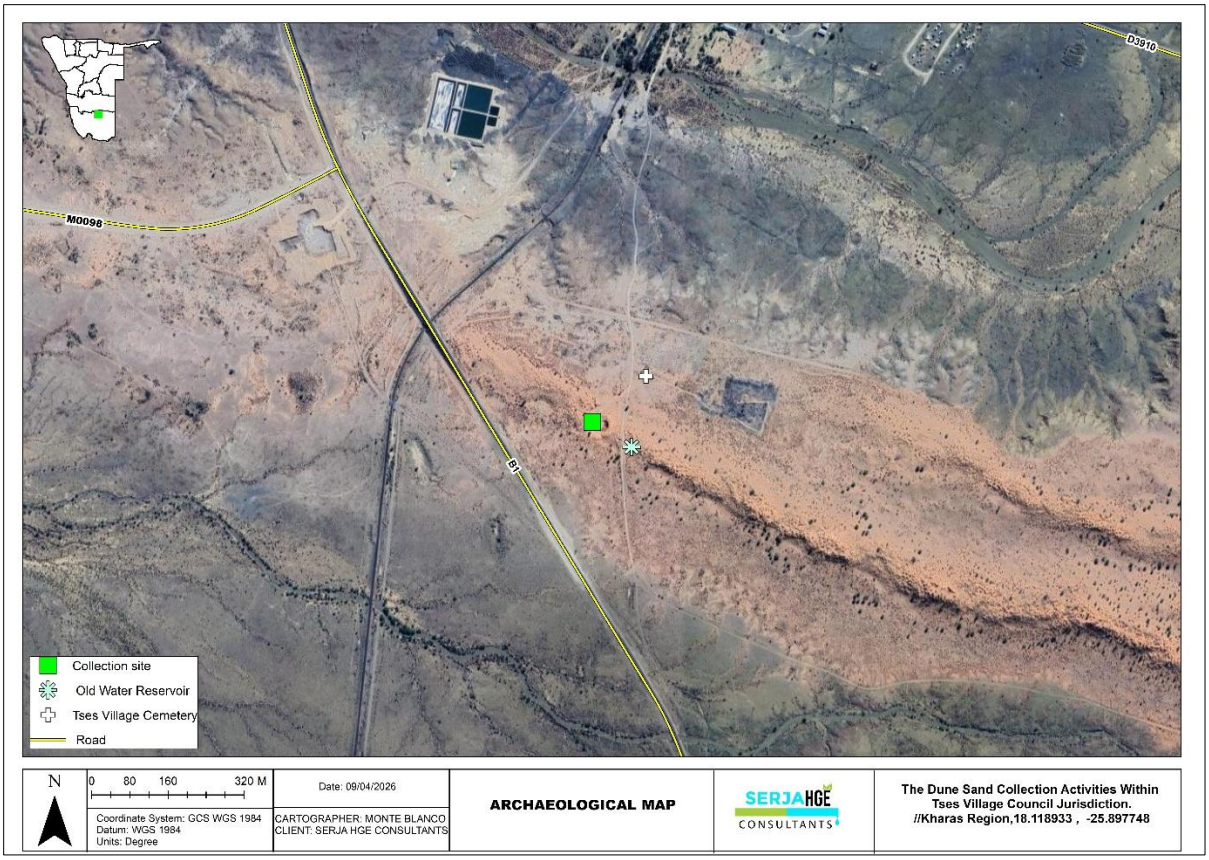


Figure 5-16: The known archaeological sites near the project site

Furthermore, if a heritage site or items of heritage significance are found during the excavation, a chance finds procedure should be followed as per the National Heritage Act, No. 27 of 2004. Moreover, care should be taken during excavation to implement archaeological management and precautionary measures. Thus, ensuring the continued protection of the resources during excavation activities in the area.

The public consultation and engagement process and means employed for the EIA Study are presented under Chapter 6.

6 PUBLIC CONSULTATION AND PARTICIPATION PROCESS

Public consultation and participation form an important component of an EIA process. It provides potential Interested and Affected Parties (I&APs) and stakeholders with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. This greatly assists the EAP (Environmental Consultant) in thoroughly identifying and recording potential impacts and to what extent further investigations are necessary. Public consultation can also aid in identifying potential mitigation measures. The consultation for this project has been done under the EMA and its EIA Regulations, and as per the following subsections.

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

Relevant and applicable national, regional, and local authorities, as well as other interested members of the public, were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers were registered as I&APs upon their request.

6.2 Communication with I&APs and Means of Consultation Employed

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process, and these have been used in guiding this process. Communication with I&APs regarding the project was facilitated through the following means, in this order. Local community input is essential to the EIA and, ultimately, to the project, ensuring the project serves both local and regional development goals.

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration, and shared with registered stakeholders / Interested and Affected parties (I&APs).
- A Stakeholders (I&AP) List was developed and updated as new I&APs register for the EIA. The BID was shared with the pre-identified key stakeholders (Appendix C).
- Project EIA notices were published in the following newspapers - Appendix D:
    - *Market Watch*: The notice appeared in the newspaper on the 7th and 14th of April 2026.
    - *Windhoek Observer*: The notice appeared in the newspapers on the 9th and 14th of April 2026. The consultation period ran from the 7th of April 2026 to the 8th of May 2026.
- EIA notices (posters) in English were prepared for printing and pasted in Tses, as shown in Figure 6-1. A copy of the notices is attached hereto as Appendix E.

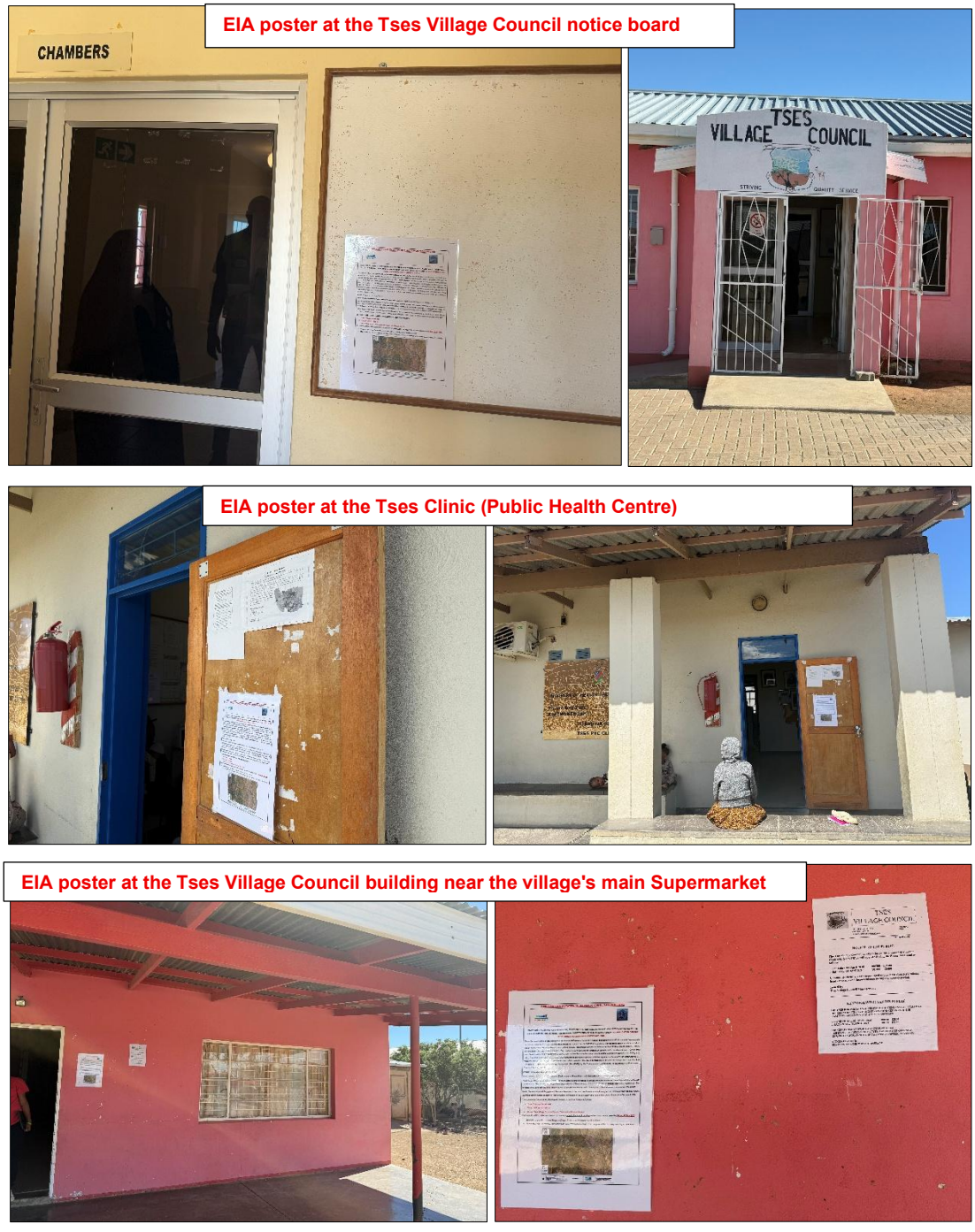


Figure 6-1: The EIA public notice posters in Tses Village

- The EIA community consultation meeting was held in Tses Village (at the community hall) on the 7th of April 2026 (Figure 6-2). The meetings were attended by nine (9), including two Environmental Assessment Practitioners from Serja HGE Consultants and seven (7) people from the local community (social activists) who also represent the Tses Community Development Committee (TCDC), including the community chairperson of the TCDC. The community attendees indicated

that the meeting invitations were received as per the posters pasted around the Village. However, the meeting's poor attendance was attributed to the pension payout (senior and vulnerable citizens grant) in the Village on that day; hence, some people came and left the meeting. On the poor attendance, Mr. Simon Kooper (a member of the TCDC) indicated that they will convey the meeting proceedings to the community in a separate meeting that will be held with the community and provide them with feedback from the EIA consultation meeting, upon which a letter will be compiled and submitted to Serja HGE Consultants.

Minutes were taken from the consultation meeting, and these are attached hereto as Appendix F.

Figure 6-2: EIA Consultation meeting in progress in Tses Village on the 7th of April 2026

6.3 Feedback and Issues Raised by the Stakeholders (I&APs)

Some issues were raised by key stakeholders and I&APs (communities) during the consultation period (consultation meeting). These issues have been recorded and incorporated into the EIA Report and EMP. The summary of these few key issues is presented in Table 6-1.

Table 6-1: Summary of main issues and comments received throughout the consultation period

Aspect	Summary of impact or concern
Comments and Issues received or noted during the consultation period (in the meeting)	
Site (community) safety and security	The site is not even fenced off to protect the children from falling in when they are playing on that side during activities. There is a need for safety signage and a security gate installed at the site.
Visual impact	There is also an issue of a visual impact because the site is close to people's sight/village, and cemetery on that side. An option to relocate the site elsewhere (towards the southeastern side of the village) was proposed. There is a linear-like site with the dune sand and two rivers.

Aspect	Summary of impact or concern
The lack of the ECC	The sand collection activities were requested to stop until the ECC is issued. The community has learned that there is no proper documentation, such as the ECC, for the project, but the Village Council also informed the community that the ECC application has started, and it was agreed that it is a good thing and an improvement.
The issue of dune sand's poor sales, and the records of sales over a long time	Sales of the sand to the company from Keetmanshoop, which has been purchasing the sand, but there is no records of sales and the unit price we are told at which the sand was sold does not make sense at all (it is very cheap and it cannot contribute to solving the Village issues, such as development and the debt owed to institutions like NamWater). Therefore, things need to change for the betterment of the whole Village.
Compliance with the relevant national and local legal framework	The project activities should comply with the Namibian Constitution, Environmental management laws, the Labour Act, the Local Authority Act, and, on the local aspect, the Tses Personal Rules to ensure their incorporation in whatever activity is conducted.
Transparency and public/community trust	Records of sale and transparency should be improved going forward by ensuring that there are proper records of sales of sand to improve transparency and earn back public/community trust.
Things for improvement should be addressed if the ECC is issued	The community requests that, should the ECC be issued for the dune sand collection, the TCDC needs to sit down with the Village Council to discuss a few things and how things should be done going forward. These aspects will cover the sales and records of the dune sand sold/transported from the site, and how the site should be run.
PPE provision to project workers	The community requests the provision of PPE to the site workers.
Supporting the development as long as things are done properly and complying with laws	The project should be done procedurally for the betterment of the Village and Community at large. The community is not against development as it grows as a society. However, things should be done properly while protecting the environment to ensure sustainable development.

The consultation period ran from the 7th of April 2026 to the 8th of May 2026 to allow the submission of comments after the consultation meeting. Comments received during the consultation meeting and email were summarized as above and indicated in the meeting minutes.

6.3.1 Concluding remark on the overall EIA Consultation process and feedback

The comments and issues raised during the consultation period were significant; however, they were not objections that would hinder, halt, or terminate the project activities. The stakeholders and I&APs would like to see the implementation of management and mitigation measures to reduce the significance of impacts during project implementation and proper implementation with transparency and continued engagement between the Tses community and the Village Council throughout the project.

The next chapter (Chapter 7) presents the identified potential impacts, the impact assessment methodology, the description of impacts, and their assessment.

7 IMPACTS IDENTIFICATION, ASSESSMENT, AND MEASURES

7.1 Identification of Potential Impacts

Sand mining (collection) and associated activities are usually associated with a range of potential positive and negative impacts. For an environmental assessment, the focus is mainly on the negative impacts likely to affect the host environment and social features. The assessment is done to ensure that these impacts are sufficiently addressed, and adequate mitigation measures are recommended thereto for implementation so that the impact's significance is brought under control, while maximizing the positive impacts. The potential positive and negative impacts that have been identified from the project activities are listed as follows:

7.1.1 Positive impacts (benefits) of the project activities

The positive impacts (benefits) of the proposed sand mining are listed below.

- Socio-economic development through job (employment) creation in the area for 7 to 15 local people. Job creation for the few people who will be working at the sand collection site. Thus, improving local socio-economic development through income generation for households
- Economic development through the provision of construction and other industrial materials to local and regional projects.
- Empowerment of local businesses: Procurement of local goods and services for the project activities by small and medium businesses in the area and Region will promote local entrepreneurship and empowerment, as well as local economic development (income generation).
- Natural resource management and sustainable land use through a regulated and managed mining practice using the Environmental Management Plan (EMP).
- New revenue stream for the Tses Village through sales of the sand to customers in different industries.

7.1.2 Potential environmental and social (adverse) impacts of the project and associated activities

The potential negative (adverse) impacts of the proposed dune sand collection are listed below. The mitigation measures for these impacts are included in the EMP.

- Soil and water pollution: improper handling of waste may lead to pollution of surrounding soils and eventually water resources systems (through wastewater runoff and infiltration).
- Land use change: The conversion of the natural landscape into a borrow pit can permanently alter landscapes, affecting the aesthetic value of the area.

- Depletion of local groundwater table: excavation of sand mining sites may affect the local water table, leading to changes in groundwater levels.
- General environmental pollution through mishandling of project-related waste.
- Loss of biodiversity through the removal of vegetation that may be found within the target sites of the site.
- Vehicular traffic: potential increase in local traffic due to site activities.
- Potential habitat destruction due to excavations for material sourcing can lead to the destruction of natural habitats for local biodiversity, if a larger area is needed.
- Impact on air quality: dust and particulate matter generated during the sand excavation, hauling, and transportation can compromise air quality in the surrounding area.
- Noise associated with the movement of heavy machinery and trucks can disturb nearby locals and animals.
- Occupational and community health and safety: Improper handling of materials and equipment may cause health and safety risks to workers and locals.
- Archaeological or cultural heritage impact through the uncovering of unknown objects during excavation.

The impacts are briefly described and assessed under the next subheadings. The management and mitigation measures are provided in the EMP for implementation.

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts arising from project activity are identified and addressed through environmentally sound approaches and legal compliance. The impact assessment method used for this project follows Namibia's Environmental Management Act (No. 7 of 2007) and its 2012 Regulations, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity), and probability (likelihood of occurring), as presented in Table 7-1.

To enable a scientific approach to determining environmental significance, a numerical value is assigned to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner, making a wide range of impacts comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the associated risk. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact,
- Assessment of the pre-mitigation significance of the impact, and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each potential impact contribute to the attainment of environmentally sustainable operational conditions for the project across various features of the biophysical and social environment. The following criteria (in Table 7-1) were applied in this impact assessment:

Table 7-1: Criteria used for impact assessment (extent, duration, intensity, and probability)

The Criteria used to assess the potential negative impacts.				
Extent or (spatial scale) - extent is an indication of the physical and spatial scale of the impact.				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Impact is localised within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond the site boundary: Regional	Impact extends beyond National or international boundaries
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short-term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term, beyond closure, permanent, irreplaceable, or irretrievable commitment of resources
Intensity, Magnitude/severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This is a qualitative type of criterion.				
H-(10)	**M/H-(8)**	**M-(6)**	**M/L-(4)**	**L-(2)**

The Criteria used to assess the potential negative impacts.				
Very high deterioration, high quantity of deaths, injury or illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat/diversity or resource, severe alteration, or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat/biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species/habitat/diversity or resource, no or very little quality deterioration.
Probability of occurrence: the likelihood that the impacts occur. This determination is based on previous experience with similar projects and/or based on professional judgment.				
Low (1)	**Medium/Low (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.3 Impact Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact in the absence of prescribed mitigation actions was measured.

Once the above factors (Table 7-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate, or low significance, based on the following significance rating scale (Table 7-2).

Table 7-2: Impact 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
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

For an impact with a high significance rating, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be adequately controlled by the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to confirm that the impact is low or medium and under control.

The assessment of the project phases is conducted for both pre-mitigation (before mitigation is implemented) and post-mitigation (after mitigation is implemented). The objective of the mitigation measures is to firstly avoid the risk, and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once the mitigation measures have been applied, the identified risk will be of low significance.

7.1 Description and Assessment of Potential Impacts

The potential impacts of the project activities are described and assessed in Table 7-3 and Table 7-4. The management and mitigation measures in the form of management action plans are provided in the EMP.

Table 7-3: The description and assessment of the potential positive impacts of the proposed dune sand mining and associated activities

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Positive Impacts											
Employment creation	Socio-economic development through job (employment) creation in the area for 7 to 15 local people. Job creation for the few people who will be working at the sand collection site. Thus, improving local socio-economic development through income generation for households.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75
Empowerment of local businesses	Procurement of local goods and services for the project activities by small and medium businesses in the area and Region will promote local entrepreneurship and empowerment, as well as local economic development (income generation).	L / M- 2	L / M - 2	L / M - 4	L / M - 2	L - 16	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44
Local and regional economic development	Economic development through the provision of dune sand as an industrial material to local and regional projects.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M - 3	M / H - 4	L / M - 4	M / H - 4	H - 75
Proper management of local natural resources	Natural resource management and sustainable land use through a regulated and managed mining practice using the approved EMP.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Revenue for the Tses Village	New revenue stream for the Tses Village through sales of the sand to customers in different industries.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75

Table 7-4: The description and assessment of the potential negative impacts of the dune sand mining (collection) and associated activities on the biophysical and social environment

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Negative (Adverse) Impacts associated with dune sand collection (mining) activities											
Unfair recruitment and procurement process	The employment of outsiders at the expense of capable local communities would create tensions and conflicts between the Tses Village Council and the community/residents. Similarly, the outsourcing of the procurement of locally available goods and services may create conflicts and lead to the loss of income for local communities and businesses.	M - 3	M - 3	M/H - 8	M/H - 4	M – 56	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Soil and Water Resources Pollution	Project activities are associated with a variety of potential pollution sources (e.g., fuel and oils) that may contaminate soils and, if not handled properly, eventually contaminate groundwater and surface water	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	(e.g., nearby streams). The anticipated potential source of pollution to water resources from the project activities would be accidental spills of fuels and oil from project vehicles and machinery. Polluted runoff during heavy rains from the project can carry pollutants such as oil, salt, and heavy metals into nearby streams and rivers, impacting aquatic ecosystems. This impact would occur during the rainy season, when surface runoff would be inevitable. However, it should be noted that the area receives little rainfall, and potential sources of pollution will be handled occasionally and locally. Therefore, the impact will be moderate and manageable.										
Habitat destruction and deforestation	Excavating on-site to prepare the site, erecting supporting infrastructure, and the actual dune sand mining can lead to the destruction of natural habitats for plants, small mammals, and reptiles. This can disrupt local biodiversity species.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Soil erosion	The removal of large amounts of soil and vegetation to allow dune sand collection can leave soils exposed to erosion, especially during occasional heavy rainfall events in this part of the region.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Air pollution	There is potential for dust owing to the movement and operation of heavy vehicles and machinery, and excavations. This can compromise air quality in the surrounding area.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: - 2	L / M: -2	L / M: -4	L / M: 2	L: -16
Noise	The nuisance associated with the movement of heavy machinery and trucks in the area can disturb locals and animals.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Waste Generation (Environmental pollution)	Waste types such as solid waste, wastewater, sewage, and hazardous waste (waste fuels and oils) are likely to be generated on-site. If the generated waste is not disposed of responsibly, land pollution may occur at the site. If solid waste, such as paper and plastic, is not properly stored or disposed of (littering), it may be consumed by local animals,	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	L - 2	L / M - 2	L - 8

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	which could be detrimental to their health.										
Occupational and community health and safety	Improper handling of materials and equipment by personnel may cause health and safety risks to workers and locals. Community safety can also be compromised by unsecured project materials, such as fuel and oils, and by unattended heavy equipment near communities.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Accidental fire outbreaks	The use of heavy equipment, especially when hydrocarbons are present on-site, may result in accidental fire outbreaks. This could pose a safety risk to the project personnel (workers), locals, and nearby vegetation.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Archaeological or cultural heritage impact	Excavation for site preparation and sand collection may result in inadvertent unearthing of archaeological cultural heritage resources. In terms of locally specific known and recorded archaeological and cultural heritage sites, there is a Tses Village cemetery (at the GPS coordinates: -25.896768, 18.120214) and an old water	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	reservoir (at these GPS coordinates: -25.898287, 18.119874). Thus, potentially vulnerable if care is not taken, especially during excavation and associated activities. Therefore, the impact is of medium significance without implementing measures.										
Negative (Adverse) Impacts from the establishment of the borrow pit (during dune sand mining)											
Physical disturbance to the site soils results in erosion.	The removal of large amounts of soil and vegetation from the site footprint can increase the risk of soil erosion (by wind or water during the rainy season). This erosion can result in sedimentation of nearby water bodies (rivers), leading to water quality issues and habitat degradation. Furthermore, the unnecessary movement of heavy vehicles off-road and equipment may lead to soil compaction.	M - 3	M / H - 4	L / M - 4	M / H - 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16
Habitat destruction	Excavation of borrow pits can destroy natural habitats for plants and small animals (mammals and reptiles) on and around the site. Thus, disrupting local biodiversity and reducing	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	the availability of resources for this wildlife.										
Impact on flora biodiversity	The clearing of sites to expand the collection site and associated areas can affect vegetation and species within the project footprint, especially protected tree species. The site is located in an area with minimal vegetation and is an already disturbed site where no major vegetation removal is required. Hence, the impact will be localized, site-specific, and therefore manageable.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Impact on groundwater table: The lowering of the local groundwater table	The borrow pit excavations may affect the local water table, leading to changes in groundwater levels. This can affect the availability of water for vegetation and communities that rely on groundwater in the area.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M -2	L / M - 2	L - 2	L / M - 2	L - 12
Air Quality: Dust Generation	There is a potential impact of dust (and particulate matter) emanating from excavation activities and from heavy vehicles moving on site access and haul roads when transporting materials from and travelling to the site. This may	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M -2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	contribute to the dust level and compromise local air quality in the area. The impact is considered likely (medium) if the measures are not implemented (if sand loads are not covered on trucks to prevent wind-blown, water is not sprayed during windy conditions, and vehicles speed on unpaved roads).										
Noise	Noise associated with operating heavy machinery, trucks, and excavation activities can disturb locals and animals in the area. Exposure of project personnel to excessive noise without protective measures in place can also be a health risk. The activities are considered small to medium in scale, and the noise level will be limited to the site and far from nearby homes in the village.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Occupational and Community Health and Safety Risks	The mishandling of machinery and equipment by workers at the site may result in injuries and, if worse, fatalities on duty. The curiosity of local children may lead them to play with unattended heavy trucks and big	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	machinery on-site if the site is not secured. The unfenced, unrehabilitated, deep, and steep-sided mining site can be a hazard to the community (people), especially for children and or animals (livestock), if they fall (slip) in.										
Vehicular Traffic Safety	Roads such as the B1 and existing access roads to and from the site are the main transportation routes for all vehicular movement in the area. There would be a potential increase in traffic on some days because of the transport of the collected dune sand to consumers from the site, as well as associated project materials, supplies, and services to and from the site. Depending on project needs, trucks, medium, and small vehicles will frequent the site area. The slow-moving heavy-vehicle traffic on these roads could potentially lead to road accidents.	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Impact on local road use	The movement of heavy trucks on the community roads (single-track sandy access roads) would	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	M / L - 4	M / L -2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	result in their deterioration, making it difficult for community small vehicles to use them due to worsened road conditions if they want to use the B1-Tses access road via the site/cemetery side of the village. Therefore, the maintenance and leveling of these roads is encouraged.										
Land use change	The conversion of the local natural landscape into an open pit (borrow pit-like) due to sand collection can permanently alter the area, affecting its aesthetic value, if rehabilitation is not implemented or done properly.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10
Archaeological or cultural heritage impact	The excavation of the site to obtain the dune sand may result in the inadvertent unearthing of unknown and unmarked graves in the area or disturbance of the existing village cemetery and the old water reservoir, etc.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L - 1	M / L - 4	M / L -2	L - 12

The recommendations and conclusions made for the EIA Study are presented in the next chapter.

8 RECOMMENDATIONS AND CONCLUSIONS

The EIA Study for the proposed dune sand collection within the Tse Village was conducted in accordance with EMA No. 7 of 2007 and its 2012 EIA Regulations as listed below.

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration, and shared with registered stakeholders / Interested and Affected parties (I&APs).
- A Stakeholders (I&AP) List was developed and updated as new I&APs register for the EIA. The BID was shared with the pre-identified key stakeholders.
- Project EIA notices were published in the following newspapers:
    - *Market Watch*: The notice appeared in the newspaper on the 7th and 14th of April 2026.
    - *Windhoek Observer*: The notice appeared in the newspapers on the 9th and 14th of April 2026. The consultation period ran from the 7th of April 2026 to the 8th of May 2026.
- EIA notices (posters) in English were prepared for printing and pasted in Tses.
- Consultation meeting: The EIA community consultation meeting was held in Tses Village (at the community hall) on the 7th of April 2026. The meetings were attended by nine (9), including two Environmental Assessment Practitioners from Serja HGE Consultants and seven (7) people from the local community (social activists) who also represent the Tses Community Development Committee (TCDC), including the community chairperson of the TCDC. The community attendees indicated that the meeting invitations were received as per the posters pasted around the Village. However, the meeting's poor attendance was attributed to the pension payout (senior and vulnerable citizens grant) in the Village on that day; hence, some people came and left the meeting. On the poor attendance, Mr. Simon Kooper (a member of the TCDC) indicated that they will convey the meeting proceedings to the community in a separate meeting that will be held with the community and provide them with feedback from the EIA consultation meeting, upon which a letter will be compiled and submitted to Serja HGE Consultants.

Some key potential positive and negative impacts were identified by the Environmental Consultant, based on issues raised by I&APs during the consultation period. The issues raised by I&APs were addressed and incorporated into this Report, whereby mitigation measures have been provided in the Environmental Management Plan (EMP) for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described and assessed. The potential negative impacts indicated a medium rating of significance. To minimize significance, the Proponent, their contractors (if any), and their workers implement appropriate management and mitigation measures to

avoid and/or minimize their impact on the environmental and social components. The effective implementation of the recommended management and mitigation measures, accompanied by monitoring, will particularly reduce the significance of adverse impacts that cannot be completely avoided (from medium to low).

8.1 Recommendations

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required for the ECC application for the dune sand collection activities. Serja Consultants are confident that the potential negative impacts associated with the project activities can be managed and mitigated through the effective implementation of the recommended management and mitigation measures and by increasing monitoring of their implementation. It is therefore recommended that the project be granted an ECC, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses, and approvals for the activities are obtained as required. These include permits and licenses, and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with the communities and or through their leaders (local leaders and representatives), and stakeholders should be maintained throughout the project cycle.
- The buffer zones around marked biological, physical, and socially sensitive sites (such as archaeological and cultural heritages; the cemetery and old water reservoir) should be respected, and no activity should be conducted inside the 50m buffer zones (boundaries).
- The Proponent, their project workers and contractors (if any) comply with the legal requirements governing their project and its associated activities, and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.
- Site areas where excavations were carried out and have ceased are rehabilitated, as far as practicable, to their pre-excavation state. This includes levelling stockpiled topsoil, backfilling trenches, and closing and capping project-associated holes and trenches.
- The EMP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer/Safety Officer), and audited by an Independent Environmental Consultant on a bi-annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF. This will be required by the Environmental Commissioner (as part of the ECC conditions).

8.2 Recommendations and Conclusions

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to reduce the significance of adverse impacts from medium to low, and eventually to negligible. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMP implementation will not only be done to ensure that the impact's significance is reducing and or maintaining a low significance rating, but also to ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

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