ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A SERVICE STATION IN AMINUIS SETTLEMENT, OMAHEKE REGION, NAMIBIA

ENVIRONMENTAL SCOPING REPORT

FINAL VERSION

ECC APP NO: 6490

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EXECUTIVE SUMMARY

Marvelous Development and Investments cc proposes the construction and operation of a new service station in Aminuis Settlement, Omaheke Region. The development will occupy a 1-hectare plot strategically located along the C22 regional road, forming a new commercial anchor node for the settlement. The project aims to provide fuel supply, a convenience shop, basic automotive services, and improved mobility support for the surrounding communities, farming areas, and social-service institutions such as the clinic, school, police station and local businesses.

The service station is expected to fill a long-standing infrastructure gap in Aminuis, where residents currently travel long distances (Gobabis, Leonardville, or Aranos) for fuel, supplies, and vehicle services. The project therefore holds strong socio-economic relevance for the settlement and the wider Aminuis community.

Environmental and Social Considerations

The environmental assessment identified potential impacts that may occur during construction and operation. These include:

Environmental Impacts

- Localised soil disturbance and erosion during site clearing and earthworks
- Dust generation from traffic, excavation and wind exposure
- Noise from construction machinery, fuel pumps and increased vehicle movement
- Increased stormwater runoff from paved surfaces
- Risk of hydrocarbon spills affecting soil or shallow groundwater
- Vegetation loss and potential spread of invasive species
- Bushfire risk in dry, windy conditions
- Solid waste generation and improper waste handling risks

These impacts are site-specific, short-term to medium-term, and manageable, provided that the mitigation measures outlined in the EMP are fully implemented.

Social and Socio-Economic Impacts

Positive impacts are significant and include:

- Improved fuel access, mobility and emergency response (clinic, police, school transport)
- Direct and indirect employment opportunities for local residents
- Local procurement and stimulation of SME activity in the settlement
- Increased safety for road users and reduced travel distances
- Growth of small businesses and improved service delivery in Aminuis
- Strengthened local economic development and alignment with NDP5, HPP II, and Vision 2030
- Enhanced convenience for farmers, households, and government institutions operating in the settlement

No major negative social impacts were identified. Minor concerns relate to increased traffic, safety around fuel storage, and potential noise — all addressed in the EMP.

Public Participation Process

Public consultation was undertaken in accordance with the Environmental Management Act (2007) and EIA Regulations (2012). Engagement included:

- Site notices placed at the Aminuis Clinic, Aminuis Settlement Office, local shops, and nearby public points
- Newspaper advertisements inviting Interested and Affected Parties (I&APs) to register and comment
- Direct engagement with the Aminuis Settlement Office, Traditional Authority representatives, nearby residents, and local businesses

Stakeholders welcomed the project and highlighted benefits such as job creation, reduced travel distances, and improved access to services. No objections or fatal concerns were raised.

Recommendation

The assessment concludes that the proposed Aminuis Service Station:

- Presents no significant or irreversible environmental risks
- Aligns with national development priorities and supports regional economic uplift
- Offers substantial social and economic benefits to the Aminuis community
- Has manageable environmental impacts when the EMP is applied
- Is compatible with existing land use and settlement planning

It is therefore recommended that the project be granted an Environmental Clearance Certificate, subject to full implementation of the Environmental Management Plan (EMP) and continued compliance with the Environmental Management Act (2007) and EIA Regulations (2012).

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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
CA	Competent Authorities
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
JBIC	Junior Baiano Industrial Consultants
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
PPE	Personal Protective Equipment

1 CHAPTER ONE: BACKGROUND

1.1 INTRODUCTION

The proponent intends to establish a new fuel retail facility, Truckport and shopping complex development within the settlement area of Aminuis, in the Omaheke Region of Namibia. The development comprises the construction and operation of a fuel retail facility, associated infrastructure, and supporting services that will enhance accessibility to fuel, basic goods, and roadside convenience services for residents, farmers, and road users along the C22 district road.

The Aminuis area has experienced steady population growth and increasing vehicle movement due to livestock marketing, government services, and inter-village mobility. Currently, fuel and essential vehicle services are limited within the settlement, requiring residents to travel significant distances (e.g., Leonardville, Gobabis, or Aranos) for refuelling. The proposed project therefore aims to:

- Improve local access to fuel and essential services
- Stimulate local economic growth
- Support mobility and transportation along the C22
- Provide employment and service-level improvements in the settlement

In line with the Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment Regulations of 2012 (Government Notice No. 30 of 6 February 2012), the proposed activity is listed as one requiring an Environmental Impact Assessment (EIA) and an Environmental Clearance Certificate (ECC) prior to commencement. Fuel storage and handling specifically triggers the need for an EIA under Section 9(2) of the Regulations, which lists the storage and handling of flammable or hazardous substances exceeding 30 m^3.

The EIA process serves to:

- Identify and assess potential environmental, social, and economic impacts arising from the project
- Review relevant legal and policy requirements governing fuel facilities

- Consider site alternatives, design options, and operational controls
- Provide mitigation measures to prevent, reduce, or manage identified impacts
- Engage Interested and Affected Parties (I&APs) and incorporate their input
- Prepare an Environmental Management Plan (EMP) to guide the construction and operation phases

To ensure compliance with national environmental legislation and to promote responsible development, the proponent has appointed Junior Baiano Industrial Consultants (JBIC) to undertake the EIA and develop the EMP for the Aminuis Service Station project. This report forms part of the formal application for an ECC to be submitted to the Environmental Commissioner under the Ministry of Environment, Forestry and Tourism (MEFT).

1.2 PROJECT LOCATION

The proposed service station will be situated on a 1-hectare (1 ha) plot located immediately adjacent to the C22 main road, within the Aminuis settlement area, Omaheke Region. The project site is positioned on the eastern side of the road, where it benefits from clear visibility, ease of access, and proximity to existing municipal layouts and services.

The surrounding land uses consist of:

- Residential erven to the southwest
- Undeveloped shrubland and communal grazing areas to the east
- Small-scale commercial activities and community services within the wider settlement
- The C22 serving as the main regional connector through Aminuis

The project site is shown in the locality map below

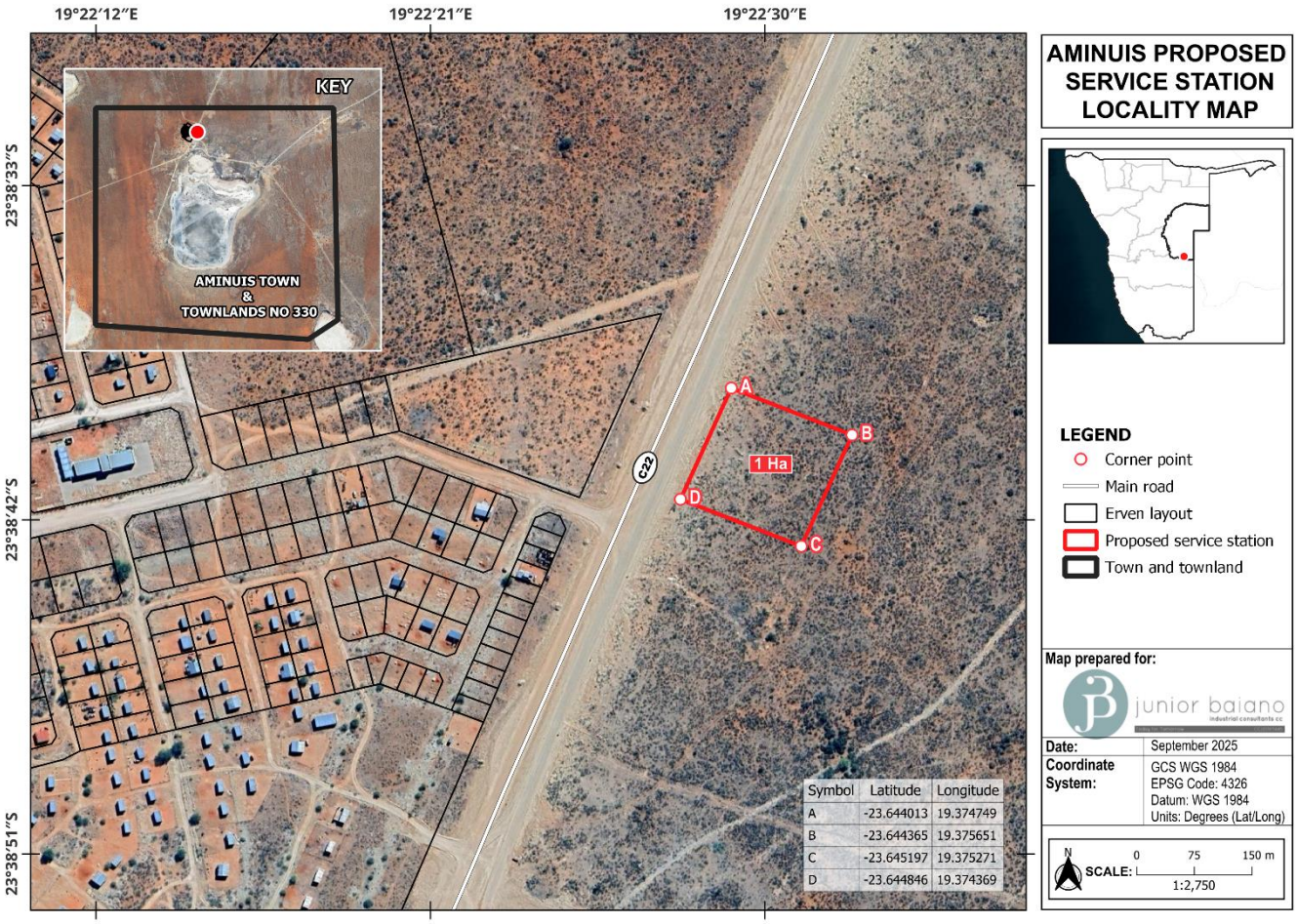

Figure 1-1: Project Location

1.3 PROJECT OVERVIEW

The proposed Aminuis Service Station project aims to establish a modern, safe, and accessible fuel retail facility along the C22 district road within the Aminuis settlement, Omaheke Region. The facility will support local residents, farmers, government service users, and long-distance travelers by providing reliable access to fuel, basic goods, and convenience services. The project aligns with national goals for rural economic development, improved service delivery, and enhanced transport safety.

The service station will consist of:

- A fuel retail forecourt with underground storage tanks
- Fuel dispensers for petrol and diesel
- A convenience shop offering essential goods, refreshments, and basic services
- Ablution facilities

- Parking and maneuvering space for light vehicles
- Supporting services such as fire protection systems, stormwater controls, and utility connections

The project is designed to enhance mobility, promote local economic opportunities, shorten travel distances for fuel, and improve service availability in Aminuis.

The proposed development will follow a structured project lifecycle encompassing planning, tendering, construction, operational activities, and future decommissioning considerations. Each stage includes environmental, engineering, technical, and sustainability elements to ensure compliance with Namibian legislation and alignment with best practice for fuel-handling infrastructure.

Figure 1-2 below provides a visual summary of the project's lifecycle phases—Planning, Tendering, Construction, Operation, and Decommissioning. The subsections that follow expand each phase in detail, outlining the technical, environmental, and sustainability considerations relevant to the proposed development.

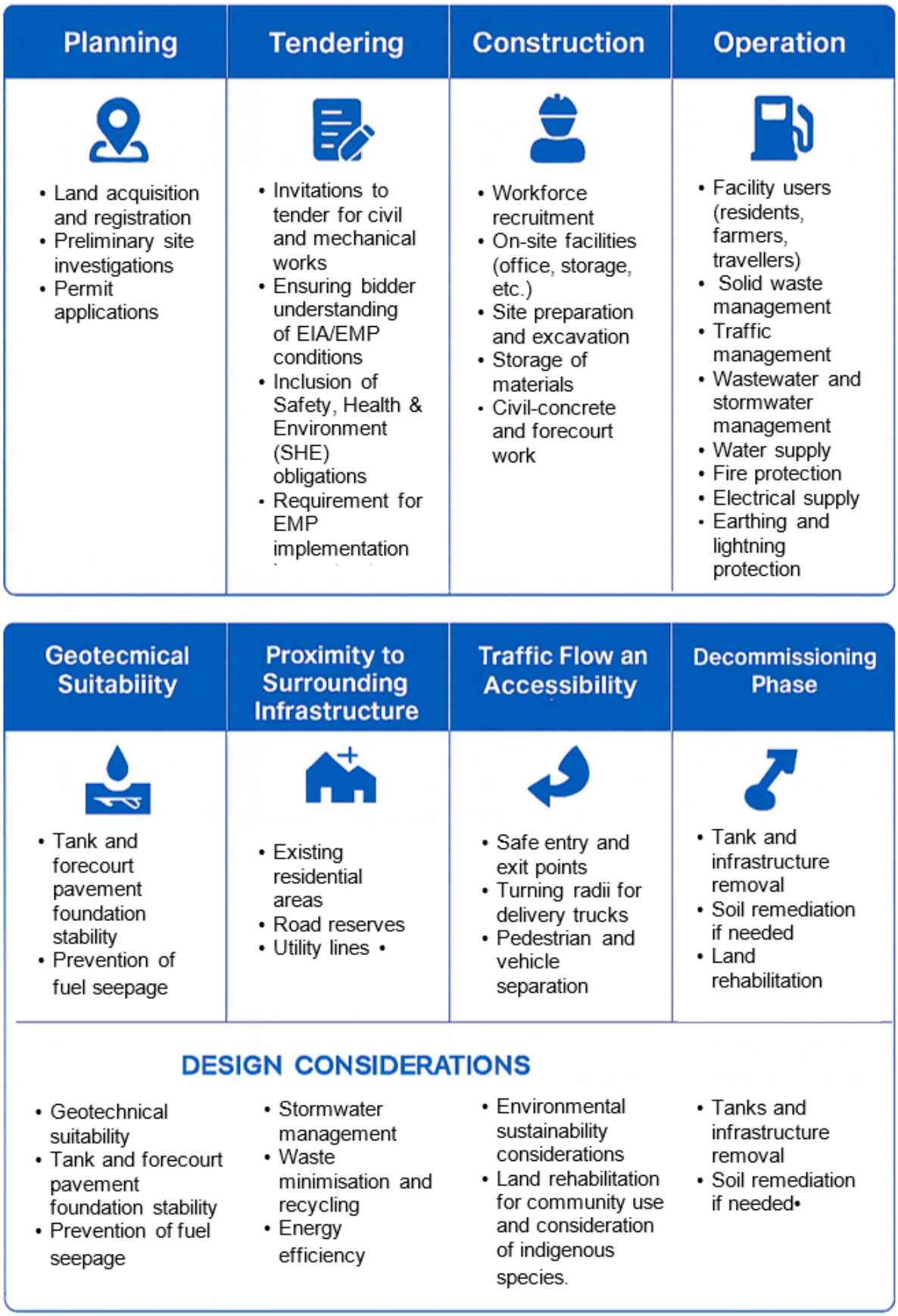

Figure 1-2: Project Process Chart

1.3.1 Planning Phase

The planning phase establishes all technical, regulatory, and feasibility elements required before construction begins. It integrates environmental safeguards, engineering design, and stakeholder engagement.

(a) Land Acquisition and Registration

- Confirmation of plot allocation from the relevant authority (Aminuis Constituency / Omaheke Regional Council).
- Verification of cadastral boundaries and integration with existing settlement layout.
- Registration and formalisation of land ownership/use rights.

(b) Preliminary Site Investigations

To determine physical suitability:

- Geotechnical investigations (soil strength, compaction, excavation suitability).
- Hydrogeological considerations (groundwater depth, potential contamination pathways).
- Topographical surveys for drainage patterns, slope stability, and site grading requirements.
- Baseline environmental condition assessment of vegetation, surface runoff, and soil characteristics.

(c) Permits and Regulatory Approvals

- Environmental Clearance Certificate (ECC)
- Fuel retail licence (Ministry of Mines and Energy)
- Building plan approval
- Fire and emergency compliance
- Water, sewer, and electricity connection approvals

(d) Design and Engineering Development

Includes preparation of:

- Forecourt layout
- UST (Underground Storage Tank) positioning
- Stormwater and drainage plan
- Fire protection systems
- Traffic and access layout
- Structural designs for canopy, forecourt slabs, and buildings
- Sewer and water reticulation designs
- Solar/energy-efficiency integration

(e) Environmental Impact Assessment (EIA)

- Conduct EIA and develop an Environmental Management Plan (EMP).
- Identify biophysical and social impacts.
- Integrate mitigation into engineering design.
- Ensure stakeholder participation and record I&AP concerns.

1.3.2 Tendering Phase

This phase ensures competent contractors are appointed and understand all environmental and technical requirements.

(a) Invitation to Tender

Issued for:

- Civil works
- Mechanical installations
- Tank installation specialists

- Electrical and plumbing works

(b) Integration of EIA/EMP Requirements

- All bidders must demonstrate understanding of environmental conditions.
- Environmental mitigation measures must be budgeted and implemented.
- Tender documents must include SHE (Safety, Health, Environment) regulations.

(c) Contractor SHE Obligations

Contractors must:

- Follow Namibian pollution control, safety, and labour laws.
- Train workers on environmental and safety requirements.
- Maintain orderly, clean site conditions.
- Provide firefighting and first-aid equipment.
- Implement spill prevention and response procedures.
- Store materials safely and prevent contamination.
- Avoid excessive stockpiles and ensure runoff control.
- Protect existing infrastructure (pipes, cables, etc.).

(d) EMP Compliance Monitoring

The proponent must:

- Conduct regular inspections
- Issue non-compliance corrective actions
- Maintain environmental records
- Perform periodic environmental audits

1.3.3 Construction Phase

This phase includes physical site works, infrastructure installation, and implementation of all safety and environmental controls.

(a) Construction Workforce

Includes:

- Engineers, technicians
- Tank installers
- Welders, carpenters
- Electricians and plumbers
- Machine operators
- General labourers (prioritising local employment)
- Security personnel

(b) Temporary Site Facilities

- Site office
- Ablution facilities
- Storage zones
- Security guardroom
- Waste collection area

(c) Site Preparation

- Vegetation clearing
- Site grading and levelling
- Excavation (tank pits, foundations)
- Dust suppression

- Erosion control

(d) Storage of Materials

- Controlled storage of sand, gravel, cement, steel, and pipes
- Weather-protected areas for sensitive materials
- Staged delivery to avoid clutter

(e) Civil and Forecourt Construction Works

- Foundation works
- Concrete forecourt slabs
- Installation of oil–water separators
- Stormwater channels
- Sewer and water piping
- Access road and parking bays

(f) Steelworks, Roofing, Electricals, and Plumbing

- Erection of canopy structure
- Installation of USTs, pipelines, pumps, dispensers
- Electrical wiring and panels
- Solar and LED lighting systems
- Plumbing for ablutions and drainage
- All works to comply with Namibian fire, building, and fuel regulations

1.3.4 Operational Phase

After commissioning, the service station will perform retail and facility management activities.

(a) Facility Users

- Local residents
- Farmers and agricultural transport
- Government service users
- Travellers via the C22

(b) Solid Waste Management

- Waste bins and skips
- Recycling where feasible
- Licensed waste removal
- EMP compliance

(c) Traffic Management

- Designated entry and exit
- Internal speed control
- Customer parking
- Safe delivery truck access
- Pedestrian movement control

(d) Wastewater and Stormwater Management

- Oil–water separators
- Well-designed drainage systems
- Regular maintenance
- Sewer or septic connection

(e) Water Supply

- Supply from settlement water system
- Potable and non-potable water separation

(f) Fire Protection

- Fire hydrants and extinguishers
- Emergency stop systems
- Hazardous material control

(g) Electrical and Energy Systems

- Connection to national grid
- Solar-assisted lighting
- Regular electrical maintenance

(h) Earthing and Lightning Protection

- Lightning arrestors
- Proper grounding of metal structures

(i) Maintenance

- Pump calibration
- Tank monitoring
- Pavement and building repairs
- Routine structural inspections

1.3.5 Decommissioning Phase

A decommissioning plan ensures environmental safety when the facility reaches end-of-life.

(a) Removal of Fuel Infrastructure

- Excavation and safe disposal of USTs

- Removal of pumps, pipelines, canopy

(b) Soil and Groundwater Remediation

- Contamination testing
- Remediation if required

(c) Site Rehabilitation

- Replacement of topsoil
- Indigenous revegetation
- Stabilisation measures

(d) Future Land Use

- Conversion to community or commercial land use
- Integration with future development plans

1.4 ACCESSIBILITY

The proposed service station site in Aminuis is located adjacent to the existing road network, making it easily accessible to users from within the settlement and surrounding villages. As shown on the locality map (Figure 2-2), the project site is positioned close to the main access routes connecting residential clusters, community facilities, and the broader Omaheke regional road system.

1.4.1 Road Access

- The site is directly accessible from the existing access road running parallel to the main internal settlement road.
- This road currently accommodates light vehicles and is suitable for integrating service-station-related traffic with minor upgrades.
- The site’s position within an established road layout ensures that no new major road realignments are required.

- Accessibility is further supported by its proximity to key local nodes, including schools, shops, and administrative facilities.

1.4.2 Regional Connectivity

- Aminuis is connected to the larger road network through the C22 regional road, which links to Gobabis and nearby communal farming settlements.
- The service station will serve both local users and transient vehicles moving between settlements, improving fuel access in a region where such services are sparse.

1.4.3 Pedestrian and Non-Motorised Access

- The surrounding land uses (residential plots and community facilities) result in a high number of pedestrian movements, including schoolchildren and residents walking to shops.
- The project design will incorporate:
    - clearly demarcated pedestrian pathways
    - safe walking zones separated from vehicle movement
    - appropriate signage at entry and exit points

These measures ensure safe co-movement of vehicles and pedestrians.

1.4.4 Service and Delivery Vehicle Access

- Fuel tankers and delivery vehicles will be able to access the site via the existing road without complex manoeuvring.
- Turning radii, access width, and internal circulation will be designed to:
    - allow safe entry and exit
    - prevent congestion
    - minimise conflicts between fuel delivery trucks and customer vehicles

1.4.5 Emergency Access

- The open road layout and proximity to the main settlement road provide clear routes for emergency services such as fire-fighting units and medical vehicles.

- Access points will be designed wide enough to accommodate emergency response vehicles, ensuring compliance with fire-safety requirements.

1.4.6 Accessibility During Construction

- Construction vehicles will use the same access road, with controlled scheduling to minimise disruption.
- Temporary signage, traffic marshals, and dust-control measures will be implemented to ensure safe movement around the site during the construction phase.

1.4.7 Sustainability and Low-Impact Access Design

The service station’s accessibility planning integrates sustainable principles, including:

- minimising new land disturbance by using existing roads
- reducing vehicle idling through efficient traffic flow design
- facilitating walking and cycling where possible
- ensuring stormwater from road surfaces is safely channelled to prevent erosion

1.5 INFRASTRUCTURE AND SERVICES

The proposed service station development will integrate into the existing municipal infrastructure of the Aminuis Settlement, which is administered by the Aminuis Settlement Office under the Omaheke Regional Council. According to the Regional Council, the settlement office provides core municipal services including water provision, sewerage management, refuse removal, street roads, and electricity distribution through CENORED. These existing services make the area suitable for the development, with additional on-site systems provided where required.

1.5.1 Water Supply

- Water supply in Aminuis is managed by the Settlement Office (Omaheke Regional Council).
- The project will connect to the existing potable water distribution system, subject to approval and confirmation of capacity.
- A dedicated metered connection will provide water for:
    - customer and staff use
    - cleaning and maintenance
    - non-potable uses (e.g., ablutions) where dual systems are used
- Water-efficient fixtures (low-flow taps, dual-flush systems) will reduce consumption.
- During construction, temporary water will be sourced through formal arrangements with the Settlement Office for:
    - concrete mixing
    - dust suppression
    - worker hygiene facilities

Note: A tender advertised in 2023 for *"Water Meter Upgrading in the Aminuis Informal Settlement"* indicates ongoing improvements to the water distribution network, confirming active municipal management of water services.

1.5.2 Wastewater and Sewerage Reticulation

- Sewerage services in Aminuis are provided where municipal lines exist, but coverage across the settlement may be partial.
- Therefore, the service station design will follow a dual-option approach

1.5.2.1 Option A — Connection to Municipal Sewer System

If a sewer connection point is available within reasonable distance, wastewater from:

- toilets
- handwashing basins
- staff ablutions

will be connected to the municipal network.

1.5.2.2 Option B — On-Site Sanitation (Where No Sewer Line Exists)

If no municipally serviced line is accessible, the development will install:

- septic tanks, and
- soakaway systems

  designed according to SANS and Namibia Building Regulations.
- Hydrocarbon-Contaminated Water
- Under no circumstances will forecourt runoff enter the sewer/septic system.
- Runoff from fuel-handling areas will pass through oil–water separators, then be discharged to approved stormwater channels.

This prevents groundwater contamination and complies with best practice for fuel installations.

1.5.3 Stormwater Management

Effective stormwater management is crucial given the sandy soils and occasional heavy rainfall typical of the Omaheke Region.

Stormwater measures will include:

- Graded, paved surfaces directing runoff away from pumps and tanks
- Oil–water separators installed on all hard surfaces
- Stormwater channels designed to:
  - prevent ponding
  - reduce erosion
  - disperse water along natural sheet-flow paths
- Landscaping with native vegetation to:
  - slow runoff
  - enhance infiltration
  - reduce sediment loss

These interventions protect groundwater and improve long-term resilience.

1.5.4 Solid Waste Management

Solid waste services are provided by the Aminuis Settlement Office, including refuse removal.

The project will:

- Provide skips and bins for general and recyclable waste
- Segregate waste where feasible (paper, plastics, metals, hazardous waste)
- Contract the local authority or licensed operator for periodic collection
- Manage construction waste (steel offcuts, packaging, rubble) responsibly
- Follow EMP guidelines for waste minimisation (reduce–reuse–recycle)

1.5.5 Electrical Power Supply

Electricity in Aminuis is supplied through a partnership between the Settlement Office and CENORED.

- The project will connect to the existing grid, using a metered connection.
- Electrical demand includes:
    - fuel pumps
    - lighting (internal and forecourt)
    - refrigeration (shop)
    - POS systems
    - CCTV/security
- To improve resilience, the project will incorporate:
    - solar lighting for external areas
    - LED energy-efficient fixtures
    - Optional backup generator (housed in an acoustically treated enclosure)

All installations will comply with Namibian electrical and fire safety standards.

1.5.6 Fire Protection Services

As a fuel facility, the site requires robust fire safety systems, including:

- External hydrants
- Strategically placed fire extinguishers
- Emergency fuel shut-off switches
- Clear evacuation routes and signage
- Separation distances for tanks, pumps, and buildings as per MME requirements
- Staff training in fire response and fuel-handling safety

These measures are consistent with fuel regulations and best practice.

1.5.7 ICT and Telecommunications

The site will connect to available telecommunications infrastructure to support:

- electronic payments
- point-of-sale systems
- CCTV and security monitoring
- staff communication
- internet access

Available options include:

- NamTel copper/fibre (where lines exist)
- Mobile broadband (4G/LTE) which is widely used in rural Namibia

1.5.8 Access Roads and Transportation Infrastructure

- The site is accessed through existing settlement roads, visible on the locality map.
- The recent upgrade of the Gobabis–Aminuis Road (Main Road 91) enhances logistics and supply chain access for fuel deliveries.
- Only minor on-site improvements are expected:
    - entrance widening
    - paving of forecourt and parking
    - signage and road markings

Design will ensure safe circulation of both light vehicles and fuel tankers.

1.5.9 Sustainability and Resource Efficiency

The project incorporates sustainability principles, including:

- LED and solar-powered exterior lighting
- Water-saving fixtures
- Oil–water separators and controlled stormwater release
- Native landscaping for erosion control
- Materials reuse during construction
- Waste minimisation (EMP-guided)

These measures reduce operational costs and improve long-term environmental performance.

1.6 NEED AND DESIRABILITY

The proposed service station is both necessary and desirable for the Aminuis settlement and its surrounding communal farming communities. Aminuis is a rural centre with dispersed villages and livestock-based livelihoods, and currently has limited access to essential fuel, vehicle services, and commercial amenities. Residents and farmers often travel long distances—sometimes over 100 km—to other settlements or towns such as Leonardville, Gobabis, or Aranos to obtain fuel and basic services. This creates economic inefficiencies, increases transportation costs, and places pressure on household income and agricultural operations.

The development of a service station in Aminuis therefore meets a clearly identified local and regional need. Figure 1-3 provides a visual summary of the key need and desirability considerations for the proposed development. The narrative below expands on each component in detail.

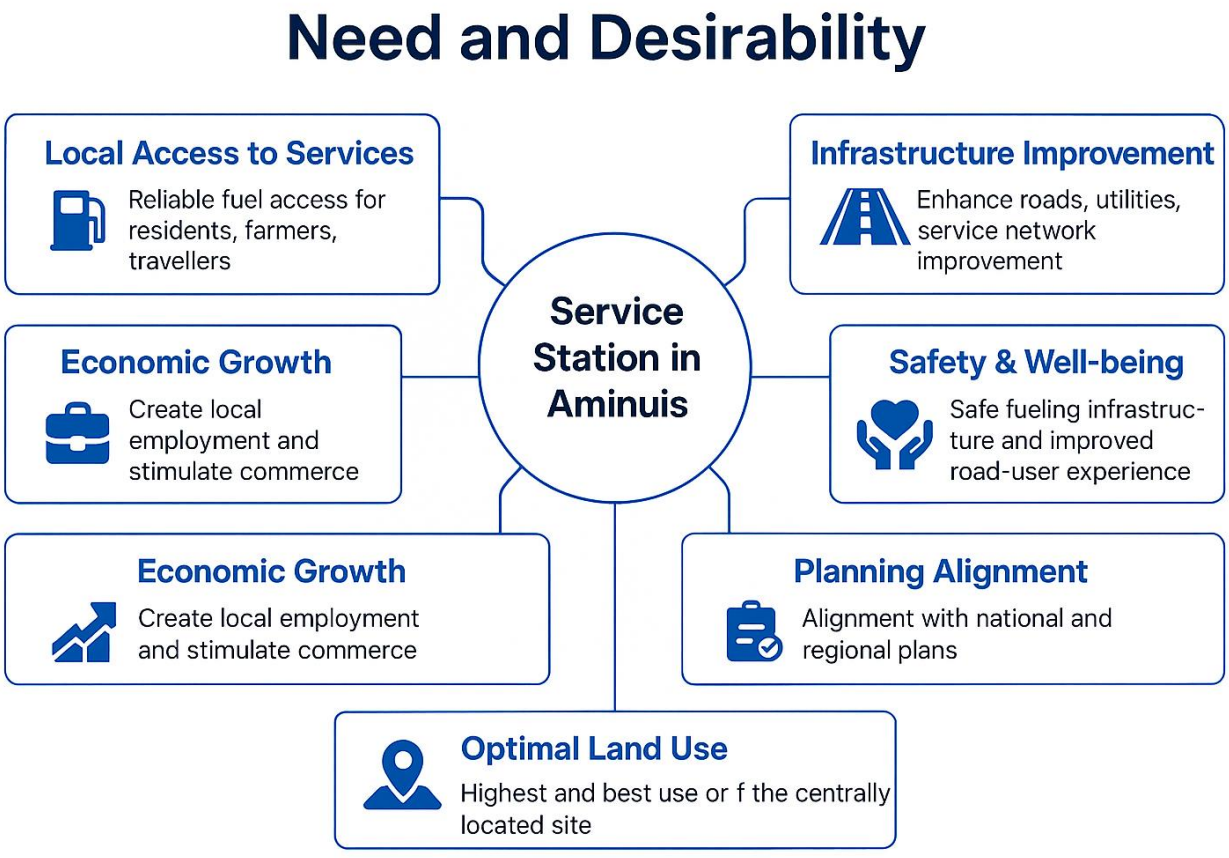

Figure 1-3: Need and Desirability

1.6.1 Improve Local Access to Essential Services

- Provide reliable access to petrol and diesel for residents, farmers, government service users, emergency services, and travellers.
- Reduce long-distance travel for fuel, improving affordability and convenience.
- Support local mobility, market access, and agricultural logistics.

1.6.2 Support Economic Growth and Rural Development

- Create employment opportunities during both construction and operation, prioritising local community members.
- Stimulate secondary economic activities such as small retail, informal trading, vehicle servicing, and supply chain opportunities.
- Increase the attractiveness of Aminuis as a service hub for surrounding villages.
- Contribute to the local revenue base through service payments, rates, and associated taxes.

1.6.3 Enhance Infrastructure and Service Provision

- Improve local infrastructure through upgraded access roads, drainage systems, and utility connections.
- Strengthen the settlement's service network, aligning with rural development strategies under the Omaheke Regional Council.
- Support future commercial expansion in the area by anchoring a core service node.

1.6.4 Align with National and Regional Planning Priorities

The project supports:

- Vision 2030 objectives related to rural development and service expansion
- NDP6 (and NDP5) goals of strengthening rural economies and reducing spatial inequalities
- Omaheke Regional Development priorities, particularly improving service access in remote communities
- National energy and fuel-access objectives by expanding safe, regulated fuel distribution networks

1.6.5 Promote Safety, Convenience, and Social Well-being

- Provide safe, regulated fuel dispensing infrastructure, reducing risks of informal or unsafe fuel storage practices.

- Improve road-user experience along the C22, especially for long-distance travellers and agricultural transporters.
- Offer a central point for access to basic goods, emergency supplies, and on-the-go services.

1.6.6 Optimal Use of the Project Site

The site's location—within an established settlement layout and adjacent to existing access roads—makes it ideal for a service station. The land has limited alternative uses that would produce equivalent socio-economic benefits. The proposed development therefore represents the highest and best use of the land in line with local planning frameworks.

1.7 PROJECT ALTERNATIVES

The Environmental Impact Assessment Regulations require consideration of feasible alternatives, including the No-Go Option, site alternatives, design alternatives, technology options, and operational alternatives. The following section outlines the alternatives assessed for the proposed service station development in Aminuis.

1.7.1 The No-Go Option

The No-Go option assumes that the proposed service station is not developed and the site remains in its current state as undeveloped land.

1.7.1.1 Environmental perspective

From a strict environmental standpoint, the No-Go Option presents:

- No disturbance to soils or vegetation
- No increase in waste generation
- No risk of fuel spills or hydrocarbon contamination
- No increase in pressure on local water and electricity services

Thus, the natural baseline and current land use would remain unchanged.

1.7.1.2 Socio-economic perspective

However, the No-Go Option is not preferred for the following reasons:

- Aminuis and surrounding villages lack reliable and accessible fuel services, requiring residents to travel long distances to Gobabis, Leonardville, or Aranos.

- Local economic activities (livestock farming, small businesses, transport services) would continue facing high operational costs.
- No new employment opportunities would be created for the community.
- Local youth would lose potential job opportunities in construction, retail, security, cleaning, and fuel operations.
- Service delivery to government vehicles, emergency services, and agriculture would remain inefficient.
- Investors may be discouraged from future commercial expansion due to lack of foundational infrastructure.
- The settlement's growth potential as a service node in the Omaheke Region would remain underdeveloped.

1.7.1.3 Conclusion on the No-Go Option

Although the No-Go Option avoids environmental impacts, these impacts can be adequately mitigated through the EMP. The social and economic costs of not implementing the project are considerably higher than the environmental risks.

Therefore, the No-Go Option is not preferred.

1.7.2 Consideration of Feasible Alternatives

Figure 1-4 provides a visual summary of the alternative options assessed during the EIA process. The detailed comparison is presented in Table 1-1 below.

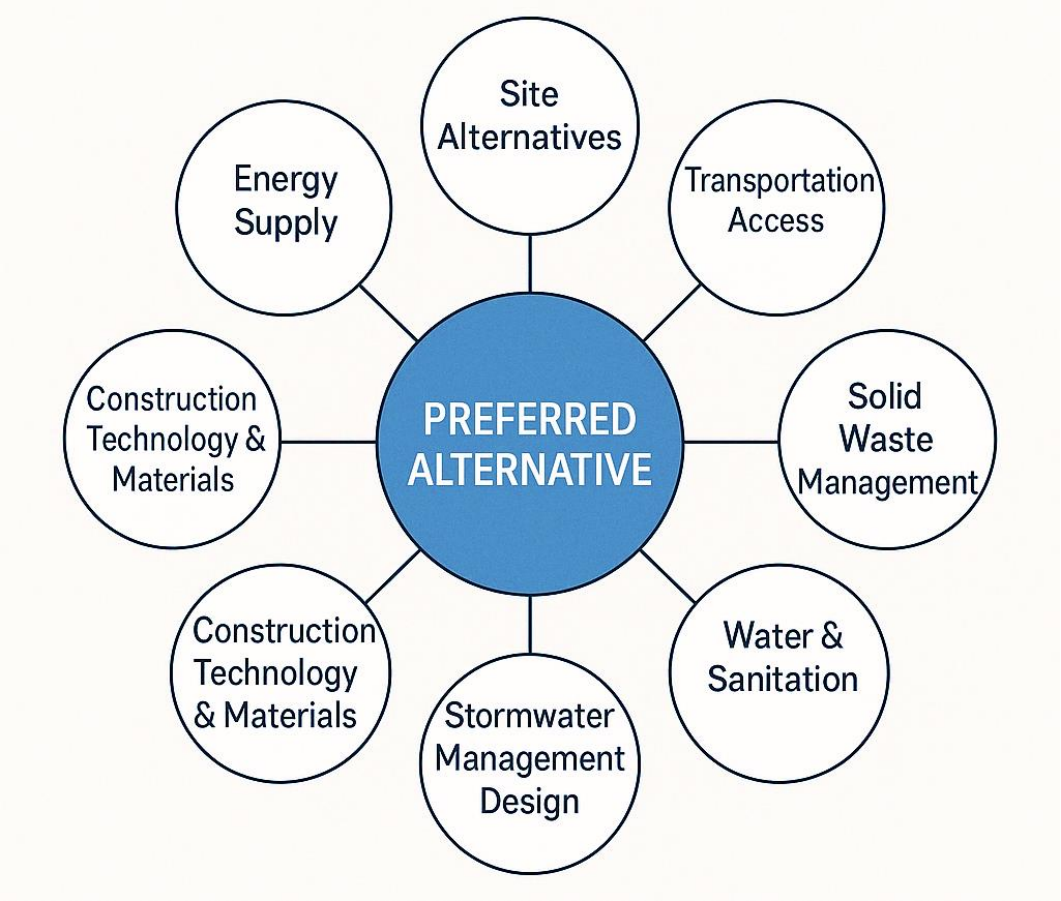

Figure 1-4: Consideration of Alternatives

The table below presents the alternatives considered for the project, including site, technology, design, services, and operational options.

Table 1-1: Alternatives Considered

Item	Description	Alternatives	Comments
1. Site Alternatives	Location of the service station	Current proposed site	This is the only serviced and strategically located plot identified by the Settlement Office for commercial fuel activities. Proximity to the main road (C22) and existing settlement layout makes it highly suitable.

Item	Description	Alternatives	Comments
2. Transportation Access	Delivery of fuel and materials	• Road transport (tanker trucks) • Rail (not available in Aminuis)	Aminuis has no rail network, therefore road transport is the only feasible option for fuel deliveries.
3. Solid Waste Management	Handling of general waste	• Build on-site landfill • Use existing municipal disposal system	On-site landfill is not feasible due to environmental risks. Waste will be transported to the Aminuis Settlement disposal site.
4. Water and Sanitation	Water and wastewater options	• Municipal water connection • Borehole on site • Septic tank/soakaway	Municipal connection is preferred where capacity exists. Boreholes require abstraction permits and may impact groundwater. Septic tanks are used where sewer lines are unavailable.
5. Energy Supply	Power sources	• Grid electricity (CENORED) • Solar energy	Grid supply is the primary option. Solar energy will supplement lighting and reduce operational costs.
6. Construction Technology & Materials	Building methods	• Conventional reinforced concrete structures • Lightweight structures	Modern reinforced concrete is preferred for durability and safety standards required for fuel facilities. Timber is minimised to reduce environmental impact.

Item	Description	Alternatives	Comments
7. Fuel Storage Technology	Tank design & safety	• Single-wall underground tanks • Double-wall underground tanks	Double-wall tanks with leak detection are preferred for safety and environmental protection.
8. Stormwater Management Design	Handling runoff	• Direct discharge • Oil–water separators with controlled discharge	Oil–water separators are required to prevent contamination and comply with best practice.

1.7.3 Preferred Alternative

Based on environmental, safety, technical, and socio-economic considerations, the preferred alternative is:

- **Development of the Service Station at the Proposed Site Using Modern, Environmentally Responsible Design Standards**

This option:

- maximises socio-economic benefits
- improves access to essential services
- supports regional development
- ensures compliance with Namibian regulations
- uses modern engineering solutions to minimise environmental risks

1.7.4 Conclusion

It is recommended that the project proceed as the preferred option. The proposed service station represents a sustainable and strategically beneficial land use that supports local development objectives in Aminuis and aligns with national and regional planning priorities. Environmental impacts are manageable and can be effectively mitigated through the EMP.

2 CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

An essential component of the Environmental Impact Assessment (EIA) process is the identification and review of the administrative, policy, and legislative framework governing the proposed project. Understanding this regulatory context enables the proponent to comply with all statutory requirements throughout the planning, construction, operation, and potential decommissioning phases of the development.

This section outlines the national legislation, policies, guidelines, and international commitments relevant to the proposed service station in Aminuis. The Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012) require that all listed activities undergo an environmental assessment and demonstrate compliance with applicable environmental, land use, health, safety, and sector-specific regulations.

The review presented here ensures that:

- the proponent is aware of all legal obligations
- environmental considerations are integrated into project design and decision-making
- the project aligns with national development priorities
- potential negative impacts are proactively managed through compliance
- the EIA process is transparent and defensible

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2.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The successful implementation of the proposed development depends on full compliance with Namibia's environmental, planning, heritage, water, safety, and fuel-handling legislation. In accordance with the Environmental Management Act (2007) and its Regulations (2012), all listed activities must be assessed against the national policy and legal framework to ensure that the project avoids, minimises, and manages potential environmental and social impacts throughout its lifecycle. The following table summarises the key legal instruments applicable to the planning, construction, operation, and eventual decommissioning of the proposed service station, and outlines the specific provisions and compliance obligations relevant to this development.

Table 2-1: Legal Compliance

Aspect	Legislation / Policy	Key Provisions	Relevance to the Project
Constitutional Obligations	Namibian Constitution (1990)	Article 95 promotes sustainable environmental management.	Guides the EIA process and requires the project to integrate sustainability principles.
Constitutional Obligations	Namibian Constitution (1990)	Article 16 provides rights to acquire and develop property.	Enables lawful development of commercial land such as the service station.
National Development Planning	Vision 2030	Promotes economic development, rural upliftment, and service expansion.	Project supports rural economic activity and enhances service provision in Aminuis.

Aspect	Legislation / Policy	Key Provisions	Relevance to the Project
National Development Planning	NDP5 / Draft NDP6	Prioritises job creation, infrastructure expansion, and local commerce.	Creates employment, improves access to essential services, and stimulates investment.
Regional & Local Planning	Regional Councils Act (1992)	Regional authorities oversee land use, service provision, and local planning controls.	Requires building plan approval, land-use confirmation, and service connection authorisation.
Regional & Local Planning	Local Authorities Act (1992)	Empowers local authorities to regulate waste, water, and public health services.	Waste disposal, water connection, and sewer services must comply with municipal rules.
Environmental Management	Environmental Management Act (2007)	Requires EIA for listed activities and mandates pollution prevention and public consultation.	Fuel retail facilities are listed activities requiring an ECC; this EIA fulfils that obligation.
Environmental Management	EIA Regulations (2012)	Defines process requirements for Scoping, EIA, public consultation, and reporting.	Guides the structure, content, and consultation requirements of this study.
Pollution & Waste Control	Pollution and Waste Management Bill (draft)	Regulates pollution, waste disposal, and hazardous substances handling.	Requires proper waste handling, spill prevention, and safe disposal of contaminated materials.

Aspect	Legislation / Policy	Key Provisions	Relevance to the Project
Soil Protection	Soil Conservation Act (1969)	Prevents soil erosion and degradation during development activities.	Construction must include erosion control, stable foundations, and proper site management.
Biodiversity Protection	National Biodiversity Strategy & Action Plan (NBSAP2)	Promotes sustainable land use and protection of biodiversity.	Landscaping should use indigenous species and limit unnecessary clearing.
Heritage Resources	National Heritage Act (2004)	Excavation must cease and NHC notified if heritage or archaeological materials are found.	Chance-find procedures apply during earthworks and excavation.
Forestry & Vegetation	Forest Act (2001)	Removal of protected species requires a permit.	Minimal vegetation exists but any removal must comply with permitting requirements.
Water Resources	Water Act (1956)	Prohibits pollution of surface and groundwater and regulates effluent discharge.	Fuel handling must prevent contamination; stormwater and wastewater must be managed responsibly.
Water Resources	Water Resources Management Act (2013) *(not fully in force)*	Provides for sustainable water use and protection.	Principles guide responsible water usage and conservation measures.

Aspect	Legislation / Policy	Key Provisions	Relevance to the Project
Fuel Handling & Storage	Petroleum Products & Energy Act (1990)	Requires fuel retail licence and regulates fuel storage operations.	Mandatory licence from Ministry of Mines & Energy for the service station.
Fuel Handling Standards	SANS 10089 / SANS 10131	Governs installation, monitoring, spacing, venting, and safety of underground tanks.	Determines engineering design, installation methods, and fire-safety infrastructure.
Occupational Health & Safety	Labour Act (2007)	Protects workers' health, safety, and welfare during construction and operation.	Contractor must implement OHS standards, PPE, training, and safety systems.
Occupational Health & Safety	Regulations 156 (Health & Safety)	Sets requirements for fire safety, machinery, hazardous areas, and emergency response.	Applies to fuel pumps, generators, workshops, and storage areas.
Public Health	Public and Environmental Health Act (2015)	Prevents conditions harmful to public health, regulates sanitation, food premises, and nuisances.	Applies to ablutions, shop hygiene, waste management, and fuel vapour controls.
Roads & Access	Roads Ordinance 1972	Regulates access to proclaimed roads and construction near road reserves.	Entrance/exit design must comply; safe tanker access must be ensured.

Aspect	Legislation / Policy	Key Provisions	Relevance to the Project
Disaster Preparedness	Disaster Risk Management Act (2012)	Provides requirements for emergency planning and hazard risk reduction.	Emergency response plans required for fire, spills, and accidents.
Electricity Supply	Electricity Act (2007)	Controls installation, quality, and safety of electrical systems.	All electrical works must be installed by qualified personnel and comply with standards.
Energy Efficiency	SADC Protocol on Energy	Promotes use of renewable energy and energy-efficient technologies.	Supports integration of solar lighting and efficient electrical systems.
International Environmental Principles	SADC Protocol on Environment	Encourages pollution reduction, ecosystem protection, and sustainable development.	Reinforces best-practice environmental management for the project.

3 CHAPTER THREE: RECEIVING ENVIRONMENT

3.1 SOCIO-ECONOMIC

The socio-economic environment describes the human, demographic, cultural and economic characteristics of the area in which the proposed Aminuis Service Station will be developed. Understanding this context is essential for assessing potential benefits, community impacts and long-term sustainability. The project is located within the Aminuis Constituency of the Omaheke Region, a remote, predominantly rural part of Namibia characterised by dispersed settlements, subsistence livestock farming, limited access to essential services and a youthful, economically vulnerable population. Aminuis serves as the constituency capital and functions as a key administrative and service node for surrounding villages and cattle posts, despite limited commercial infrastructure.

The settlement is further influenced by a rich cultural history, significant migration patterns, and the legacy of colonial-era land allocations, all of which continue to shape socio-economic conditions today. As a result, the proposed service station will play an important role in improving access to fuel, transportation services, employment and retail opportunities, thereby strengthening local economic resilience.

3.1.1 REGIONAL CONTEXT — OMAHEKE REGION

The Omaheke Region has an estimated population of approximately 92,000 residents (NSA, 2023). It remains one of Namibia’s least densely populated regions, defined by vast rangelands, semi-arid climate conditions, and heavy reliance on cattle, goats and small-stock farming. Livelihoods are strongly influenced by agriculture, small businesses, government employment, and social protection grants, with limited diversification into secondary or tertiary sectors.

From a demographic perspective, Omaheke has a youth-heavy population, with nearly half of residents below the age of 20. This demographic structure creates a significant demand for employment, education and training opportunities. The region’s economic profile reflects these challenges: unemployment rates remain above the national average, literacy levels are lower than those of more urbanised regions, and access to modern services is uneven.

Access to water, sanitation, electricity and telecommunications varies across the region. Many rural households rely on communal water points, boreholes and traditional sanitation systems. Electrification in rural settlements is improving but remains limited, with wood and charcoal continuing to dominate as the primary cooking fuel. Transport infrastructure is

characterised mainly by gravel roads linking small settlements to larger service towns such as Gobabis.

The socio-economic conditions of Omaheke Region highlight the importance of new commercial and service developments. Improved access to fuel, goods, employment and infrastructure directly aligns with regional development priorities. The proposed service station will therefore contribute to broader economic upliftment by improving mobility, supporting farming operations, creating jobs and enabling small businesses to operate more efficiently.

Linking sentence:
To illustrate the regional disparities and development gaps relevant to the project, Table 3-1 presents a comparison of key socio-economic indicators between Namibia and the Omaheke Region.

Table 3-1: Selected Socio-Economic Indicators (NSA Census 2023)

Indicator	**Namibia (2023)**	**Omaheke Region (2023)**	**Implications for Aminuis Project**
Population	~3.02 million	~92,162	Small regional market; service station will serve dispersed rural households
Youth population (<20 yrs)	~36%	~46%	High demand for jobs and youth services
Literacy (15+ yrs)	~91%	~77%	Training programmes essential for local employment
Unemployment	~22%	~34–38%	Project provides crucial job creation
Main household income	Wages (57%)	Farming (41%), wages (39%)	Project supports non-farming income diversification

Indicator	Namibia (2023)	Omaheke Region (2023)	Implications for Aminuis Project
Safe water access	87%	~70%	Infrastructure improvements needed; project increases service node reliability
No toilet facility	36%	~50–55%	EMP must include sanitation for workers and users
Cooking energy	Wood/charcoal: 46%	~67%	Project must consider fire safety and environmental sustainability
Distance to services	Urban advantage	Rural disadvantage	Fuel station fills major accessibility gap

3.1.2 Local Context — Aminuis Settlement

Aminuis is a cluster of rural settlements located in eastern Omaheke, approximately 500 km from Windhoek. It serves as the administrative centre of the Aminuis Constituency and accommodates schools, churches, government posts and a small commercial network. According to the NSA 2023 Census, the estimated settlement population ranges between 6,000 and 7,000 residents, with many additional people residing in surrounding villages, farms and cattle posts who depend on Aminuis for essential services.

3.1.2.1 Settlement Structure and Land Use

Your locality map shows that Aminuis has a mixture of formal and informal settlement layouts. Residential erven, institutional facilities and community structures form the core settlement area, while the project site lies along the main access road (C22), just outside the high-density residential zones. The settlement exhibits characteristics common to Namibia's rural communal areas: low-density housing, limited formal businesses, reliance on livestock farming, and scattered homesteads.

The absence of a formal fuel station, supermarket, banking services, and modern recreational facilities significantly limits the area's economic potential. Currently, residents

often travel 70–100 km to neighbouring centres for fuel and essential supplies, increasing household transport costs and constraining business activity.

3.1.2.2 Economic Characteristics

The dominant livelihood activities in Aminuis include subsistence and small-scale livestock farming (cattle, goats and sheep), small businesses, informal trading and social grant-supported households. Recurrent droughts have weakened traditional agricultural systems, increasing household vulnerability and limiting income generation. Employment opportunities are scarce, particularly for youth and women. A service station is therefore expected to create vital jobs, stimulate value chains, support micro-enterprises and strengthen local mobility.

3.1.2.3 Services and Infrastructure

Aminuis hosts a post office, police station, constituency office, schools, churches and limited retail. Basic infrastructure such as electricity is available along main settlement roads, while water is supplied through a combination of boreholes and settlement distribution lines. Sanitation varies, with many households depending on traditional pit latrines or shared sanitation. Roads are predominantly gravel, which affects transport reliability, especially during rainy seasons.

Telecommunications services are available, although connectivity strength varies. Mobile money services are widely used, but access to formal banking is limited due to the absence of commercial financial institutions.

3.1.2.4 Cultural and Historical Context

Aminuis holds deep cultural significance for the Ovambanderu and Herero communities. Historically, the area served as one of the “Native Reserves” established under colonial rule for displaced Herero populations following the Herero–Nama War (1904–1907). Complex migration, traditional authority dynamics and land allocation patterns have shaped the contemporary social fabric.

The area is known for events such as the Battle of !Gu-!oms of 1905, the establishment of early missionary stations (Catholic mission in 1902), and the post-World War I settlement patterns that expanded the Ovambanderu and Herero communities in the region. Today, several traditional authority structures maintain influence over local governance, cultural events and community cohesion.

This rich historical and cultural background informs community expectations, land-use planning and the need for respectful engagement throughout project implementation.

3.1.3 Key Socio-Economic Indicators — Omaheke & Aminuis

he socio-economic baseline for Aminuis reveals structural service gaps and development constraints that strengthen the justification for establishing the proposed service station. These conditions include high youth dependency, dispersed settlements, limited access to essential services, and an economy heavily reliant on subsistence livestock farming. Understanding these factors is important as they strongly influence the project's potential benefits and its interaction with the local community. To visually summarise these socio-economic realities, Figure 3-1 illustrates the key contextual considerations relevant to the Aminuis Service Station.

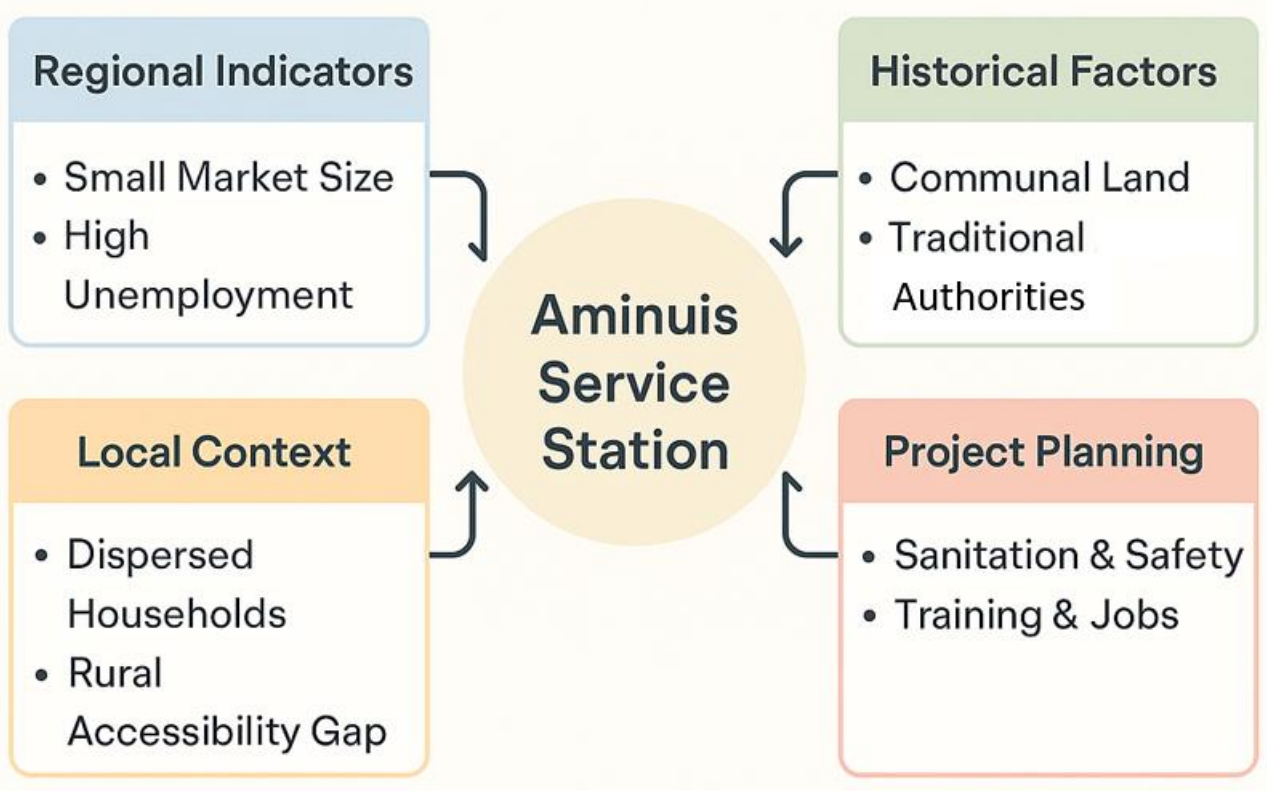

Figure 3-1: Socio-Economic Considerations for Aminuis Service Station

The detailed socio-economic conditions of Aminuis are further outlined in Table 3-2, which synthesises settlement-level characteristics highly relevant to the proposed development.

Table 3-2: Key Socio-Economic Conditions in Aminuis Settlement

Indicator	**Aminuis Situation**	**Implications for the Service Station Project**
Settlement Type	Rural settlement; administrative centre of Aminuis Constituency	Central service node → strong justification for fuel & retail facility
Population Pattern	Scattered households; low-density	Station provides reliable services, reduces long travel distances
Youth Population	≥ 45% residents under 20	High need for youth jobs + training
Employment Levels	High unemployment; informal farming & piece-work dominate	Project creates stable employment + microenterprise opportunities
Main Livelihoods	Subsistence livestock farming (goats, cattle, sheep)	Fuel access strengthens farming logistics, mobility & emergencies
Access to Fuel	No local fuel retail; nearest station 70–90 km away	Critical unmet demand; major travel cost savings
Access to Basic Services	Limited sanitation, ICT gaps, moderate water access	Project must provide sanitation; improves local service reliability
Transport & Roads	Located on C22; internal gravel roads	Station improves road safety & supports long-distance travellers
Local Infrastructure	Has clinic, police, schools; no commercial hub	Station becomes new economic anchor point
Energy Use in Households	Mostly firewood & charcoal	Station provides electricity-supported services (refrigeration, charging)
Traditional Governance	Communal land under Traditional Authority	TA engagement essential for acceptance & local cooperation

The indicators highlight that Aminuis faces limited access to essential services, high unemployment, a young population, and long travel distances to fuel and commercial services. These socio-economic realities emphasise the strategic importance of establishing the service station as a local mobility hub, an employment generator, and a stimulus for small business development. In this context, the project is expected to contribute directly to livelihood improvement, rural accessibility, and local economic diversification.

3.1.4 Socio-Economic Sensitivities

Key sensitivities specific to the Aminuis context include:

- Grazing land and livestock movement along the C22 road
- Proximity of residential areas to construction activities
- Dust and noise impacting vulnerable households
- Limited access to formal waste disposal systems
- Cultural and traditional authority engagement needs
- Existing pressure on water supply systems
- High reliance on social protection, making price-sensitive services important

These sensitivities are manageable through appropriate EMP measures.

3.1.5 Socio-Economic Opportunities

The project will introduce significant positive socio-economic benefits, including:

- Improved access to fuel and essential goods
- Reduced travel time and costs
- Enhanced safety (fuel for emergency services, police, clinic vehicles)
- Local job creation (10–20 direct jobs)
- Stimulated micro-enterprises (car wash, tyre repair, vendors)
- Strengthened road mobility in Aminuis Constituency
- Increased economic participation for marginalised youth and women

3.2 CLIMATE

3.2.1 Overview of Climatic Setting

Aminuis lies within Namibia’s semi-arid Kalahari climate zone, characterised by low and variable rainfall, high evaporation, hot summers, and low atmospheric moisture. These climatic constraints directly influence water demand, infrastructure durability, and dust levels at the proposed service station site. Because Aminuis experiences persistent water deficits and high temperature extremes, the project design must incorporate climate-resilient water

supply, shaded areas for workers, and solar energy options to reduce operational pressure on the grid.

3.2.2 Rainfall Patterns

Rainfall in Aminuis typically ranges from 200–300 mm/year, falling predominantly between December and March as short-lived convective storms. This limited and unreliable rainfall creates challenges for groundwater recharge, grazing capacity, and dust suppression at construction sites. As shown in Figure 3-2, Aminuis lies within a low-rainfall band across central and eastern Namibia, highlighting the chronic water scarcity in the region. The pronounced year-to-year variability, depicted in Figure 3-3, further reinforces the need for reliable groundwater abstraction and covered water storage within the service station design.

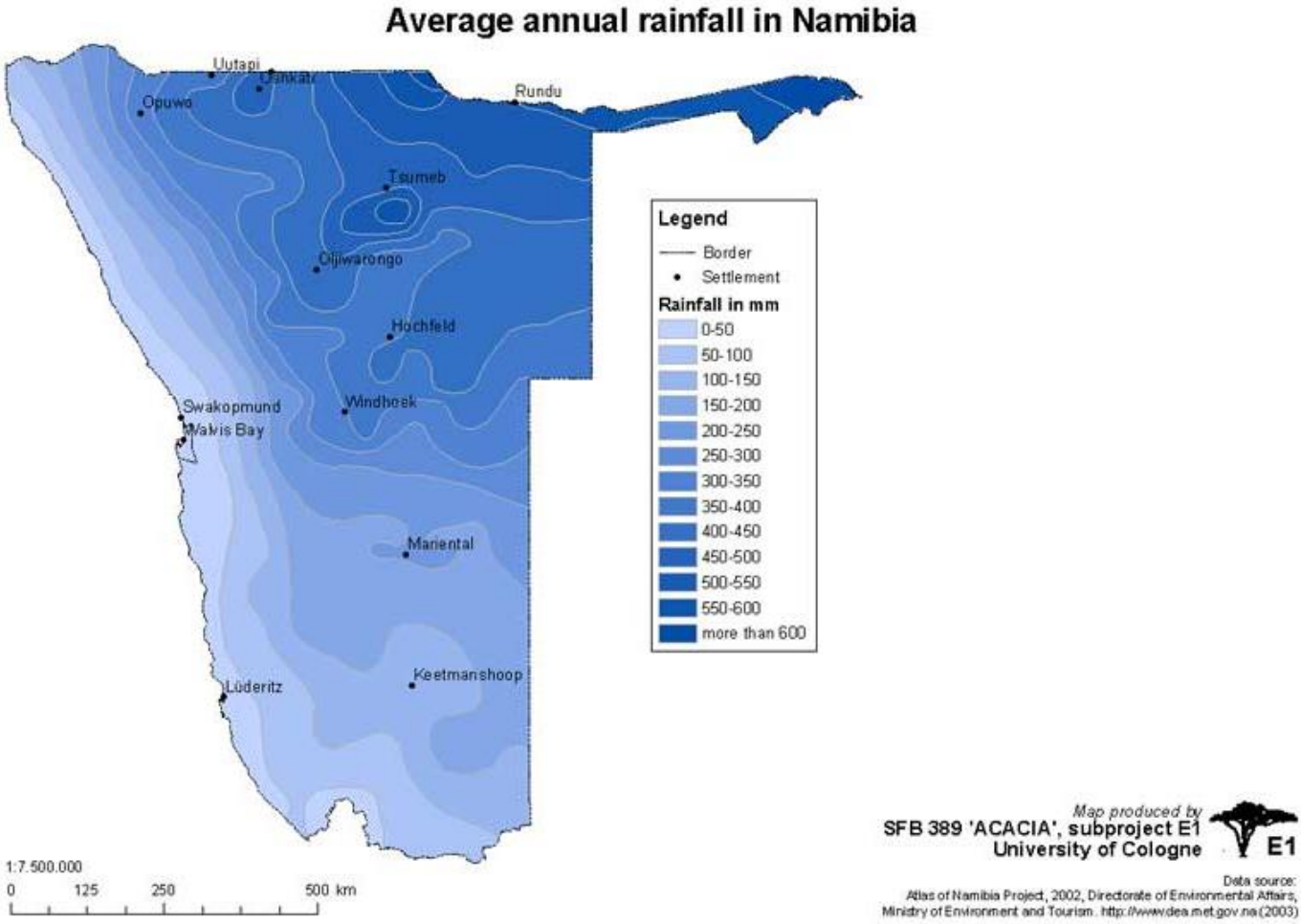

Figure 3-2: Average Annual Rainfall in Namibia

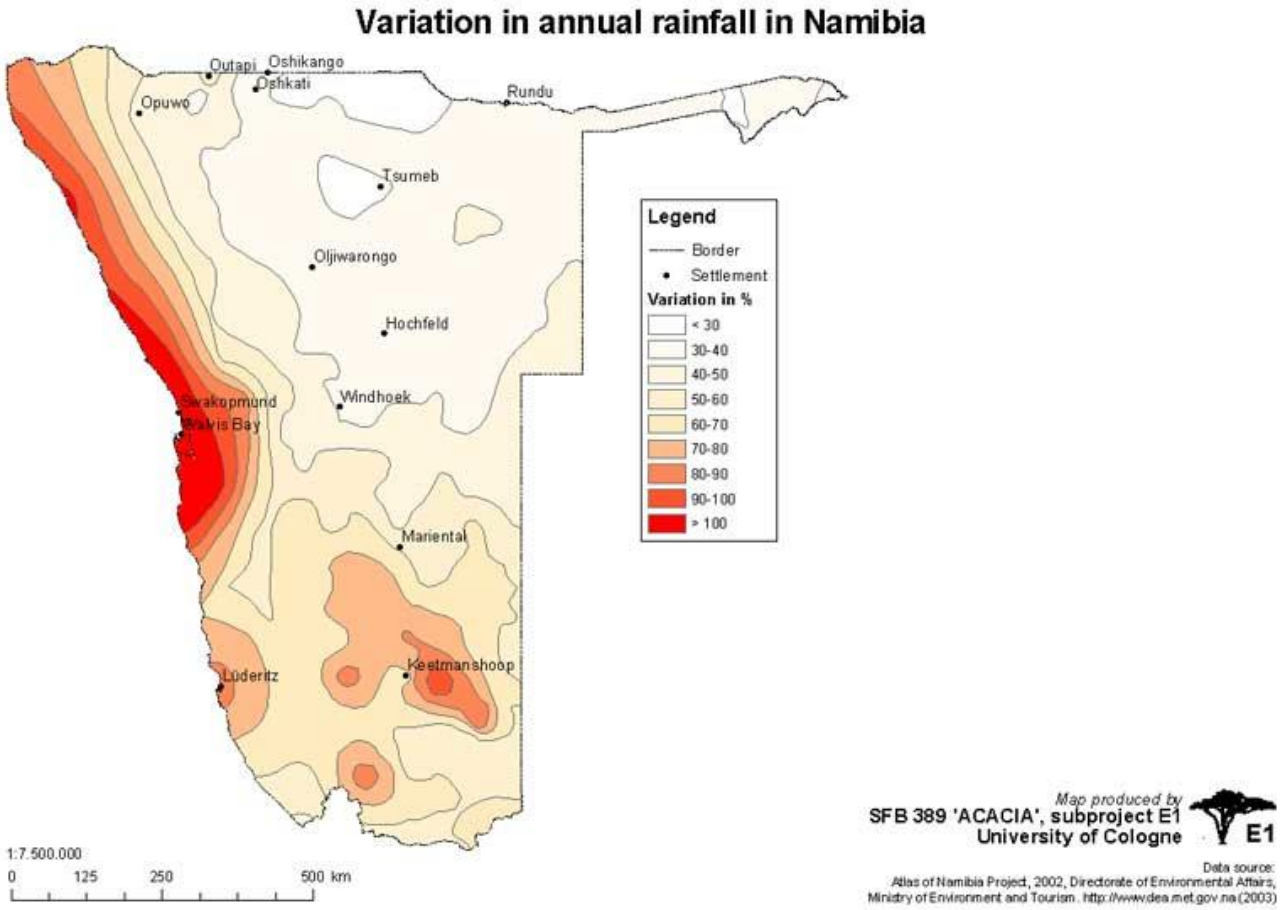

Figure 3-3: Variation in Annual Rainfall in Namibia

3.2.3 Climate Variability and Extremes

Aminuis exhibits high interannual rainfall variability, often fluctuating by more than 40–60% between successive years. Multi-year droughts are common, while occasional high-intensity storms create brief flash-flooding in interdunal pans and local depressions. These extremes affect seasonal accessibility on gravel roads and influence how stormwater drainage must be designed around the service station footprint. The patterns illustrated in Figure 3-3 show that Omaheke is among Namibia's most unpredictable rainfall zones, requiring climate-adaptive planning for all infrastructure.

3.2.4 Temperature Regimes

The Aminuis area experiences hot summers and cool winter nights, consistent with the inland semi-arid climate:

- Mean annual temperature: 20–22°C
- Summer peaks: 32–36°C (occasionally >38°C)

- Winter minima: 2–6°C

These thermal extremes influence fuel storage safety, the demand for shaded customer waiting areas, and construction worker safety protocols. As illustrated in Figure 3-4, Aminuis is located within one of Namibia's warmer inland temperature belts, reinforcing the need for heat-responsive design.

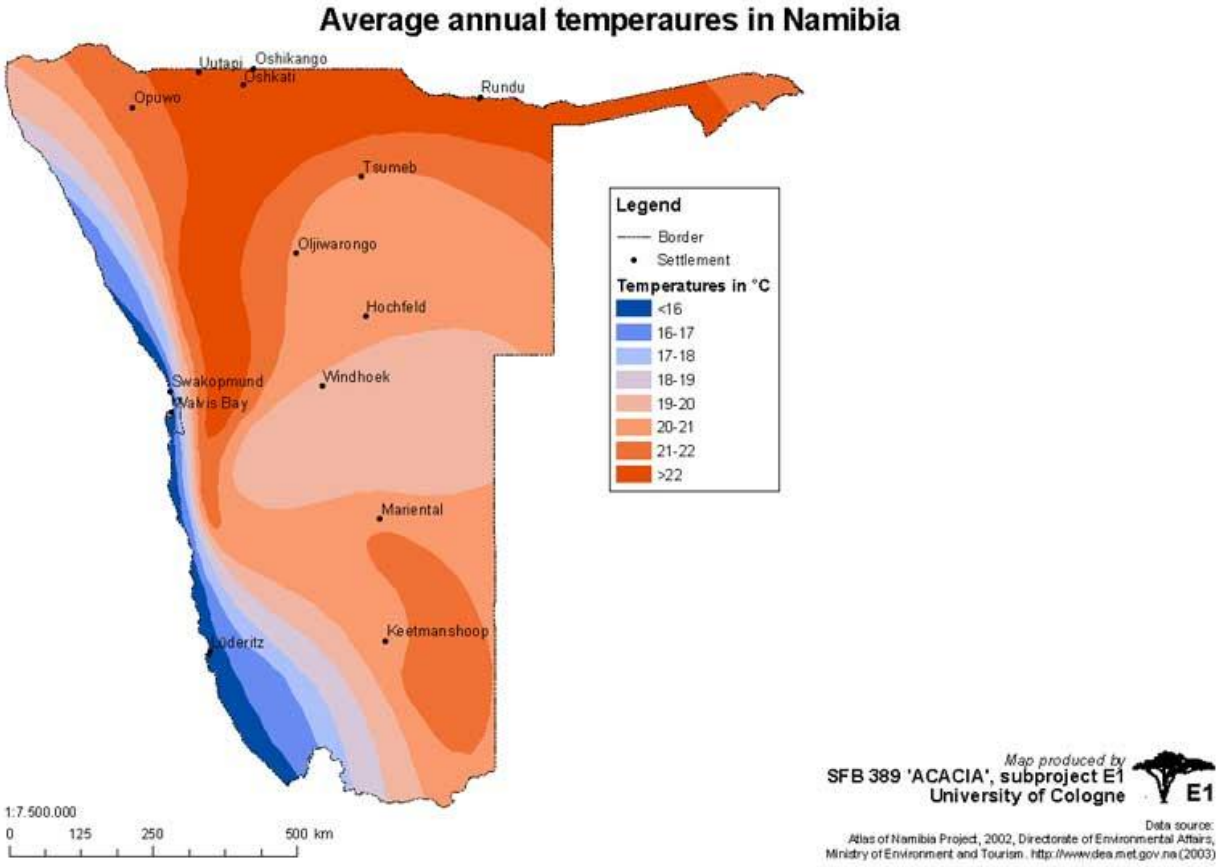

Figure 3-4: Average Annual Temperatures in Namibia

3.2.5 Evaporation and Water Balance

Evaporation in eastern Omaheke is exceptionally high, typically 2600–3000 mm/year, far exceeding annual rainfall. This creates a strongly negative water balance, where nearly all rainfall evaporates shortly after falling. Figure 3-5 shows that Aminuis falls within the high-evaporation interior zone of Namibia, while Figure 3-6 illustrates the resulting water deficit.

Implications for the service station:

- Open water storage is inefficient → covered tanks required
- High soil dryness → dust control measures needed

- Regulated groundwater extraction → compliance with WRMA essential

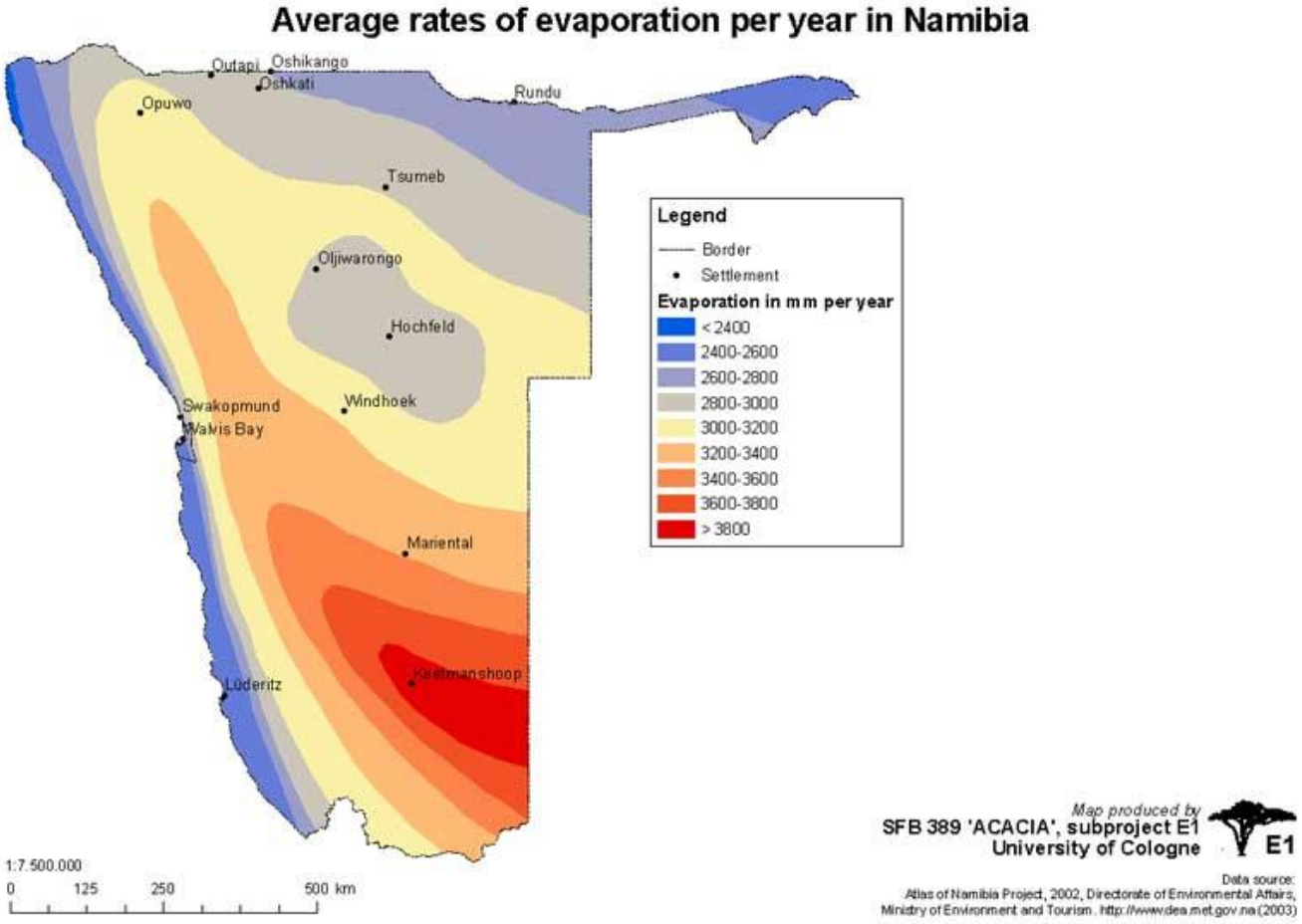

Figure 3-5: Evaporation Map

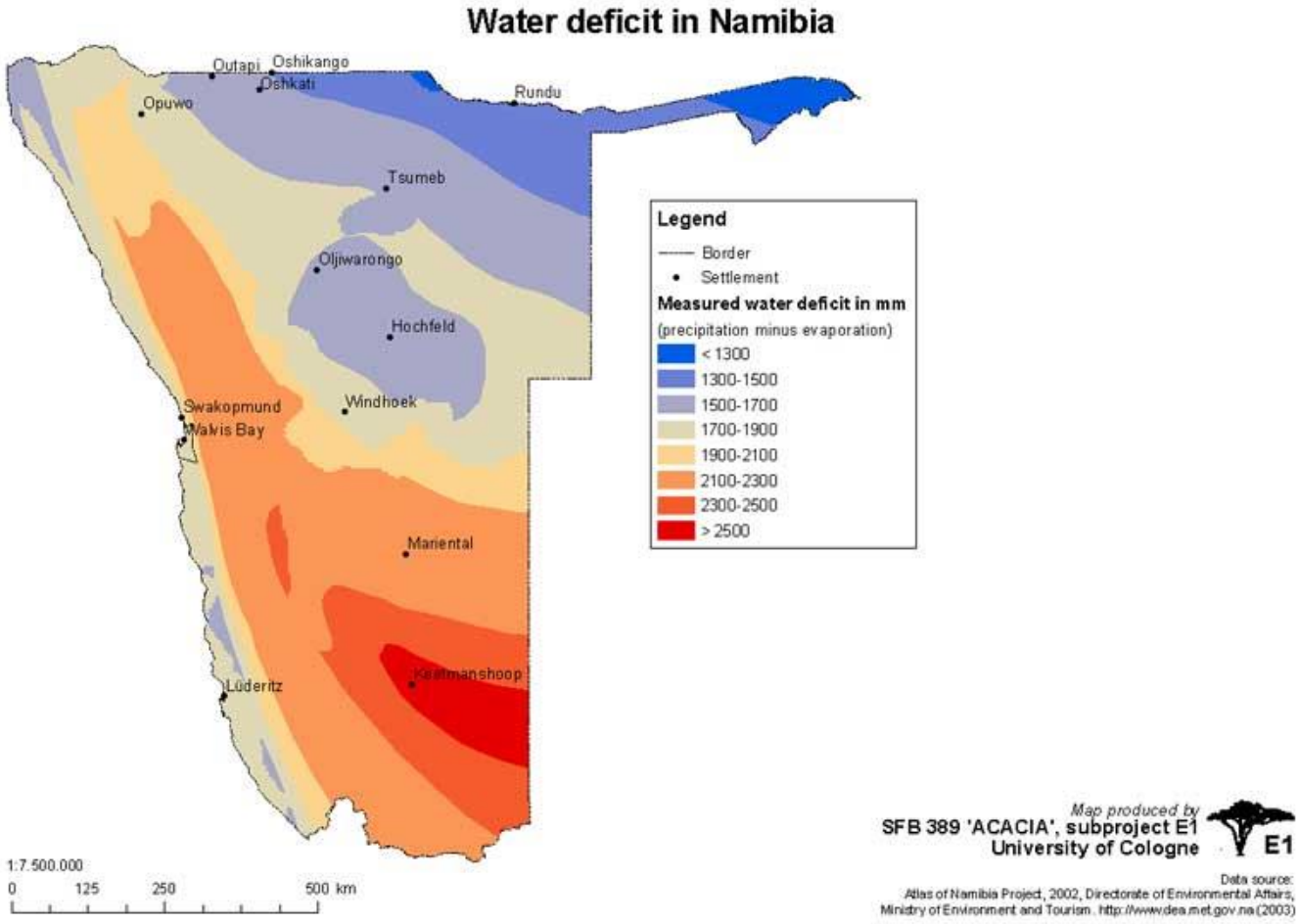

Figure 3-6: Water Deficit Map

3.2.6 Humidity and Atmospheric Moisture

Relative humidity in Aminuis is persistently low, often **15–25%**, especially during the driest months (July–September). Low humidity increases evaporation, intensifies dust mobilisation, and elevates dehydration risks for staff and contractors. **Figure 3-7** confirms that eastern Namibia, including Aminuis, falls within one of the driest atmospheric zones in the country.

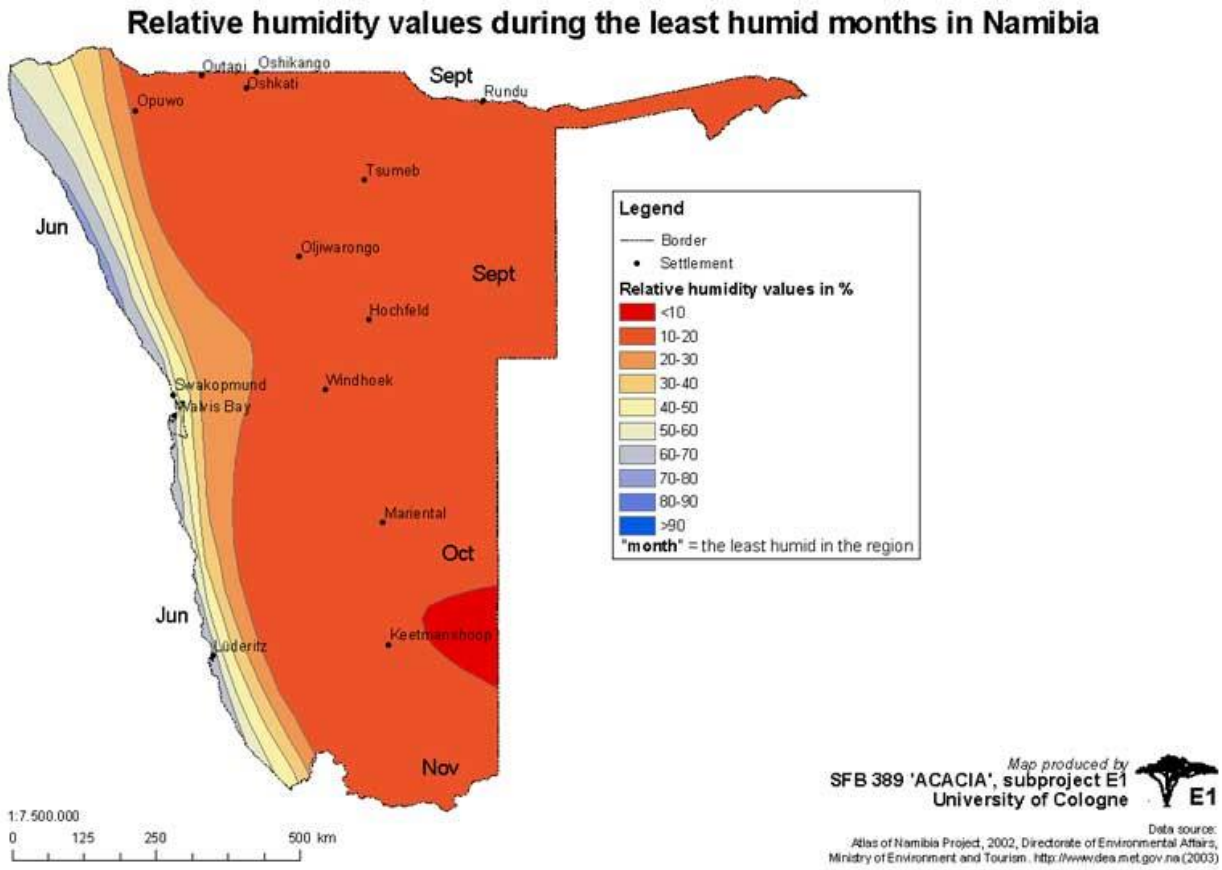

Figure 3-7: Relative Humidity Map

3.2.7 Wind Patterns

Aminuis experiences prevailing easterly and south-easterly winds, with stronger gusts during late winter and early spring. Occasional berg winds may sharply increase temperatures and enhance veld fire risk. For the project, wind direction must inform the placement of:

- fuel vents
- waste management zones
- signage and canopy structures
- dust-prone construction zones

Wind conditions significantly influence dust spread and site layout considerations.

3.2.8 Solar Radiation

Aminuis lies within a high solar radiation corridor, receiving approximately 5.8–6.2 kWh/m²/day, as illustrated in Figure 3-8. These levels make solar energy a highly feasible

and cost-effective option for powering lighting, pumps, refrigeration, and auxiliary systems at the service station. Integrating solar energy will also support Namibia's broader climate-neutral development pathways.

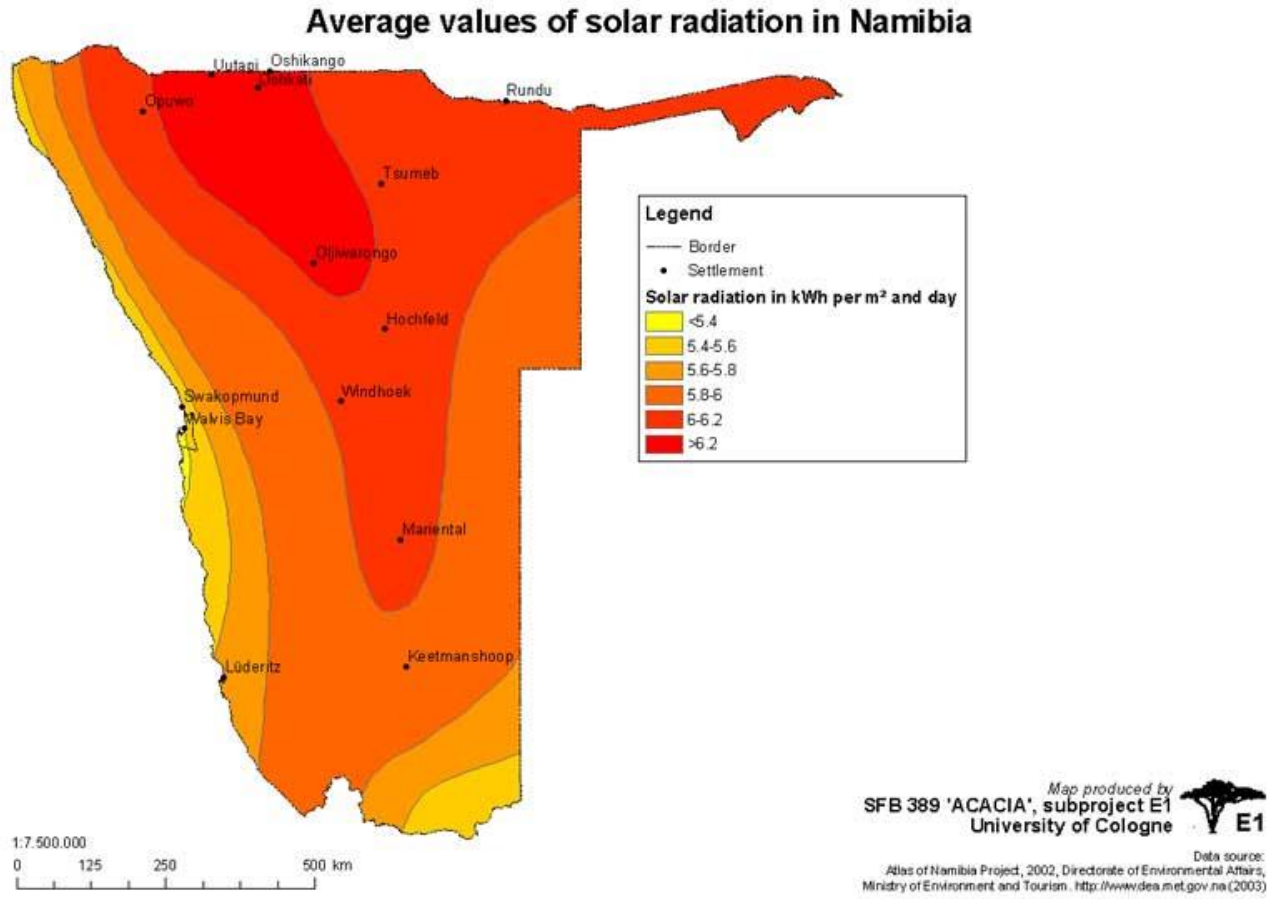

Figure 3-8: Solar Radiation Map

3.2.9 Implications of Climate for the Proposed Service Station

The table below gives a summary of the of climate implications for the service station. The subsequent sections give more detail.

Table 3-3: Summary of Climate Implications for the Service Station

Climate Factor	Key Conditions in Aminuis	Implications for the Service Station
Optimal Construction Window	Dry, cool months (May–Sept)	Best period for earthworks, reduced heat stress, improved machinery performance

Climate Factor	Key Conditions in Aminuis	Implications for the Service Station
Water Resources	High evaporation; groundwater-dependent	Use covered storage tanks; strict water budgeting; adhere to abstraction permits
Dust & Air Quality	Low humidity, loose soils, seasonal winds	Dust suppression (watering, speed limits); phased clearing; compact surfaces
Heat Stress	Summer peaks 34–38°C	Shade structures, adjusted work hours, hydration; ventilated fuel infrastructure
Stormwater & Rainfall	Low annual rainfall but intense storm events	Engineered drainage, graded surfaces, kerbs, controlled runoff away from tanks
Solar Radiation	Extremely high sunlight exposure	Solar-powered lighting, signage, pumps; reduced reliance on grid electricity

3.2.9.1 Favourable Construction Period

The climatic pattern in Aminuis makes the months between May and September the most suitable period for construction activities. During this time, temperatures are lower, humidity is minimal, and rainfall is almost entirely absent. Working in this cooler and drier season reduces the risk of heat exhaustion for construction workers, improves the performance of machinery, and enhances compaction efficiency for foundations, pavements, and fuel forecourt surfaces. Scheduling critical construction processes during this period will therefore minimise weather-related delays and ensure safer, more predictable working conditions.

3.2.9.2 Water Resource Management

Given the high evaporation rates and the settlement's reliance on groundwater resources, all project water storage and handling systems must be designed to minimise losses. This includes using covered, closed, or partially enclosed water tanks and ensuring all operational water fixtures are efficient. Because the hydro-climatic setting results in a persistent water deficit, groundwater abstraction for construction or operations must strictly comply with the Water Resources Management Act and local permitting procedures.

Efficient water budgeting—especially during the dry season—is essential to avoid pressure on the community boreholes that supply households and livestock.

3.2.9.3 Dust and Air Quality

Aminuis experiences low humidity, dry soils, and frequent seasonal winds, which can lead to significant dust generation during site clearing, earthworks and high-traffic movements. Unmitigated dust can affect nearby residents, schools, the clinic and road users. To manage this, dust suppression will require a combination of controlled watering, vehicle speed limits, phased clearing, and compaction of disturbed surfaces. During operations, dust will mainly arise from gravel access roads and parking areas, making periodic maintenance and surface stabilisation important.

3.2.9.4 Heat Stress Management

Summer temperatures often reach 34–38°C, creating occupational health risks and operational constraints. For the construction workforce, measures such as shade structures, scheduled rest periods, adjusted working hours, and readily available drinking water are essential. High temperatures also influence fuel vapour pressures, necessitating properly ventilated underground storage installations and adherence to fuel-handling safety standards. During operations, shaded waiting areas for customers and climate-responsive building materials (e.g., reflective roofing) will help maintain safe and comfortable conditions.

3.2.9.5 Stormwater Management

Although rainfall is low overall, summer convective storms can produce short bursts of intense runoff. Without proper management, this can cause surface ponding, erosion around underground tanks, and unsafe driving conditions at the forecourt. The service station must therefore include engineered stormwater drainage channels, kerbing, graded surfaces and runoff-control structures designed for rapid dispersion. Stormwater should be directed away from fuel-handling zones and into controlled channels to prevent contamination and protect infrastructure.

3.2.9.6 Energy Opportunities

Aminuis receives some of the highest solar radiation levels in Namibia, making solar energy a practical and cost-efficient supplement to grid power. Integrating solar-powered lighting, signage, water-pumping systems, and auxiliary power will enhance operational reliability during grid outages and reduce long-term energy costs. This is especially beneficial in a rural settlement where electricity interruptions may occur. Solar integration also supports

Namibia's broader renewable-energy and climate-resilience objectives, adding sustainability value to the project.

3.3 TOPOGRAPHY, RELIEF AND LANDSCAPES

The Aminuis settlement lies within the gently undulating eastern Kalahari Basin, characterised by broad plains, subdued relief and low-gradient floors. Unlike the rugged, dissected landscapes of north-western Namibia (as seen in Figures 3.9 and 3.10), the Aminuis area exhibits a relatively uniform topographic profile, with elevations ranging between approximately 1,150 m and 1,250 m above sea level. The terrain consists predominantly of sandy plains with pockets of calcrete, interrupted by shallow depressions and localised dune-like accumulations typical of the semi-arid Kalahari sandveld.

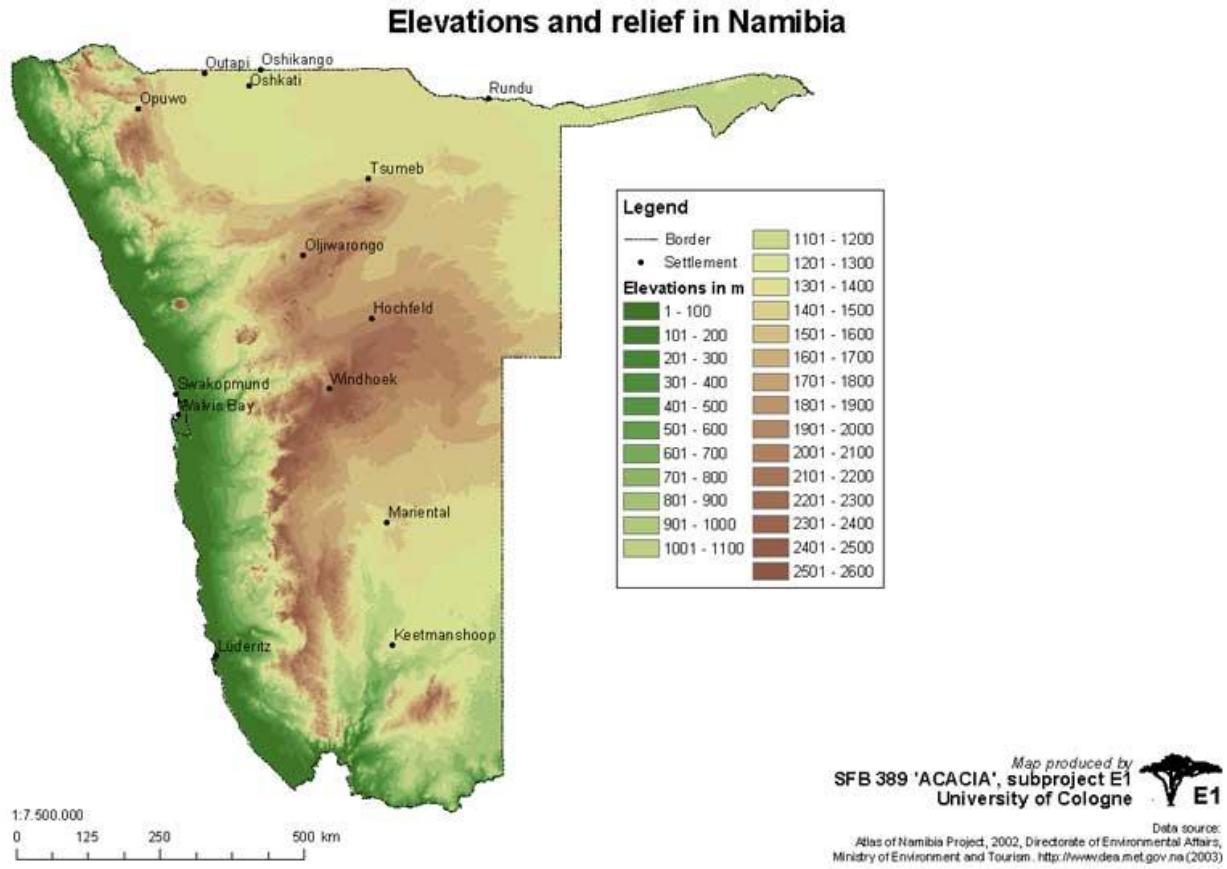

Figure 3-9: Elevations and Relief in Namibia

Compared to the western escarpment and high-relief zones illustrated in Figure 3.9: Elevations and Relief in Namibia, Aminuis lies on the flatter, more homogeneous Omaheke landscape, which provides favourable conditions for construction, fuel-tank placement and

access-road design. The absence of steep slopes means reduced erosion risk, easier stormwater management and minimal constraints for the service station layout.

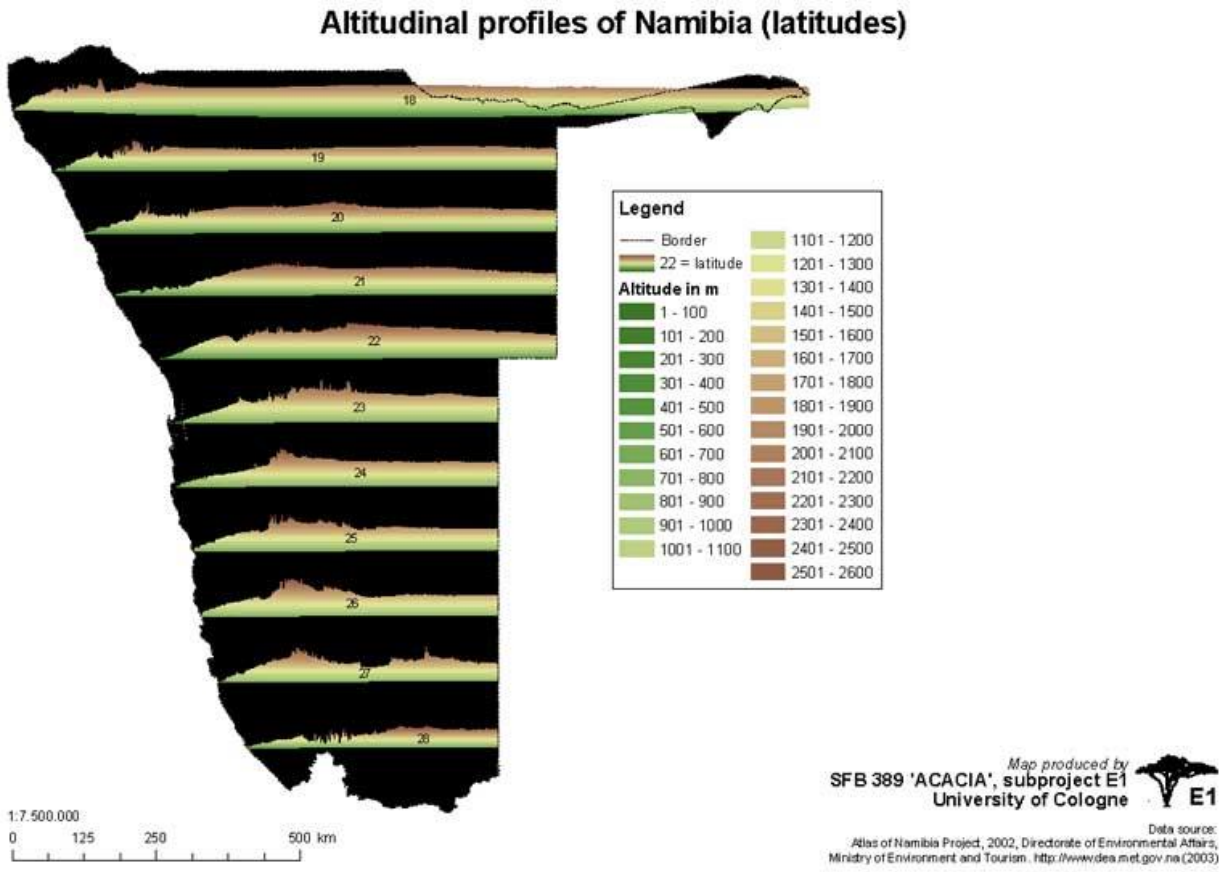

Figure 3-10: Altitudinal Profiles of Namibia

The altitudinal transects shown in Figure 3.10 further highlight that Aminuis falls within the mid-elevation interior plateau, where relief is stable and gradual. These characteristics translate into predictable drainage patterns, lower susceptibility to wash-outs and a more secure foundation zone for infrastructure.

3.4 SOILS

The Aminuis area is dominated by deep Kalahari sands, characteristic of the south-eastern Omaheke Region. These soils correspond mainly to Arenosols and Calcisols, with localised patches of Regosols, as illustrated in Figure 3.11: Dominant Soils in Namibia. The sandy-profile soils are typically well-drained but nutrient-poor, weakly structured, and highly susceptible to wind erosion when disturbed.

Because these soils have low cohesion, construction activities must account for:

- Compaction challenges during foundation preparation
- Dust generation during earthworks
- Potential rutting on untreated access tracks
- Moderate–high erosion sensitivity under windy and dry conditions

Calcrete layers that occur sporadically across Aminuis offer firmer substrates but require careful excavation planning to avoid destabilising the upper sand horizons. For the service station, the soil profile determines the engineering approach to:

- Fuel-tank burial
- Pavement reinforcement
- Stormwater control
- Rehabilitation of temporarily disturbed areas

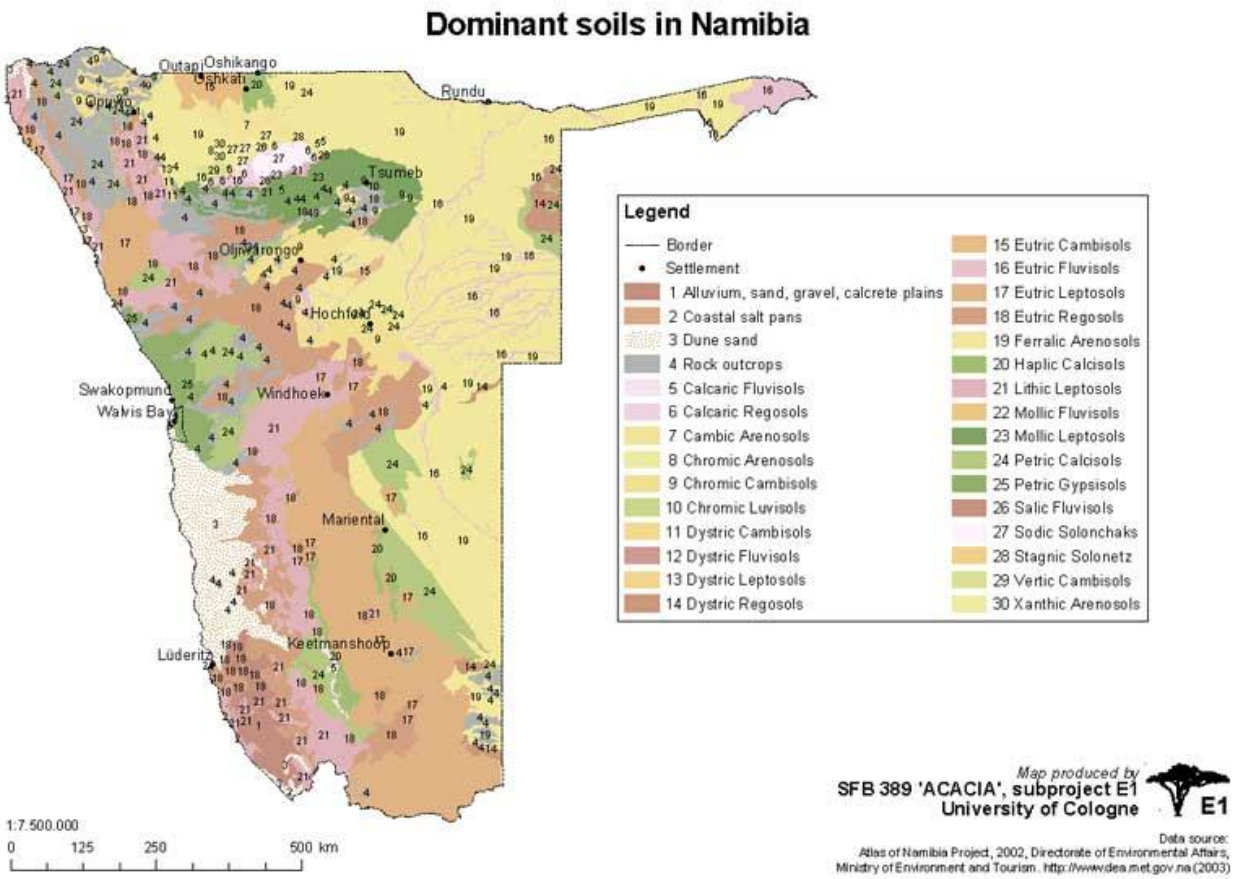

Figure 3-11: Dominant Soils in Namibia

3.5 GEOLOGY

Geologically, Aminuis is part of the South-Eastern Kalahari Group, overlying older formations associated with the Damara Supergroup to the west. The local bedrock is generally deeply buried beneath aeolian sands, with calcrete-cemented horizons occurring near the surface in some areas. The regional geological map (Figure 3.12) shows that Omaheke is underlain by extensive sand-dominated units with underlying schists and sandstones further west.

For the service station project, the key geological considerations include:

- Stable substrate for fuel tank installation due to moderately firm calcrete zones
- Low rock excavation risk because underlying bedrock is deeply buried
- Groundwater sensitivity—unconfined aquifers occur within sandy soils, making spill prevention essential
- Ease of trenching for utility lines (water, electricity, sewerage)

The permeability of sandy materials requires robust spill-containment and impermeable linings in fuel handling areas to protect the shallow aquifer. Although the fracture-rock aquifers depicted in Figure 3.12 dominate western Namibia, the Aminuis setting emphasises porous sandy aquifers, which are highly vulnerable to contamination.

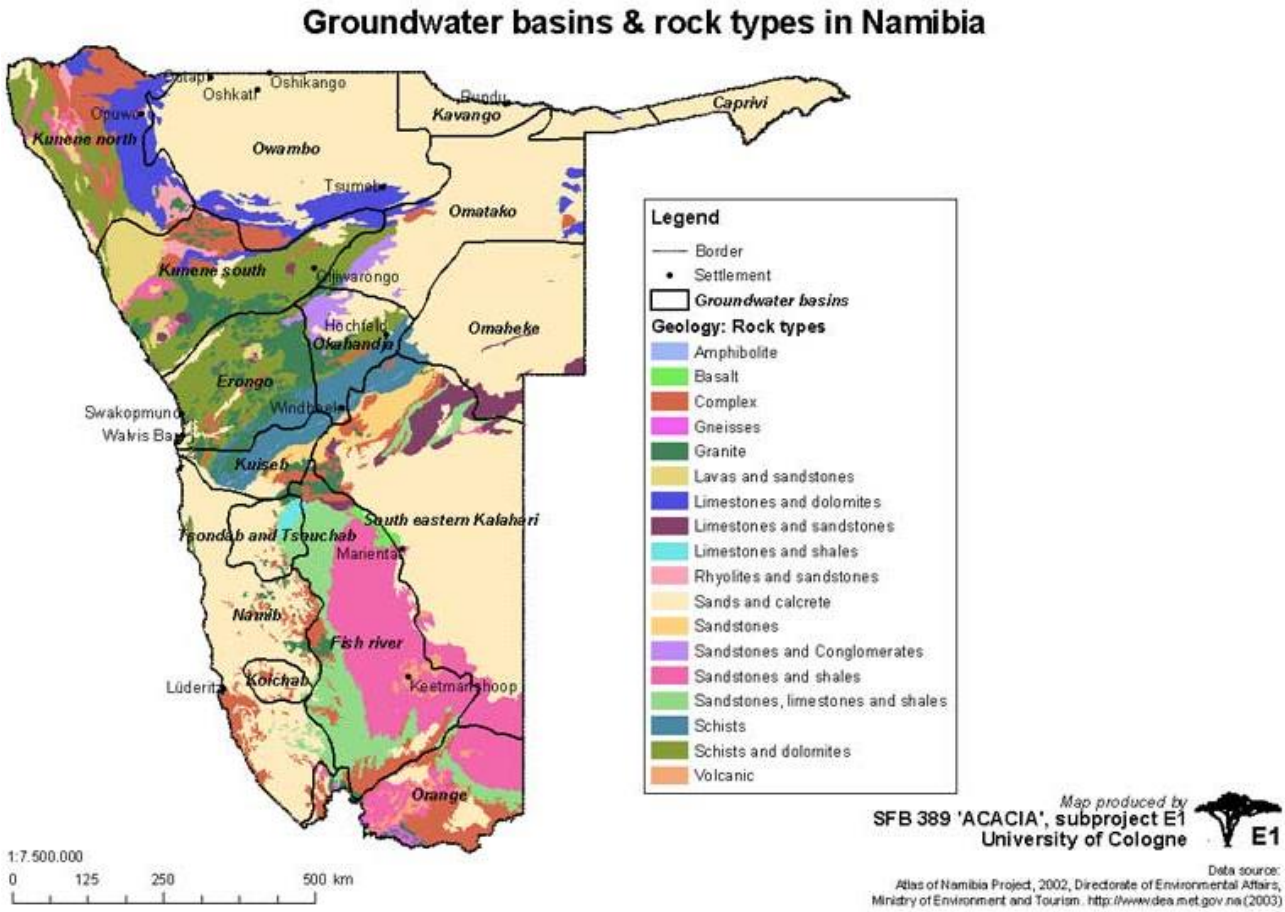

Figure 3-12: Groundwater Basins and Rock Types in Namibia

3.6 HYDROLOGY

Aminuis falls within a dry, semi-arid hydrological zone with no perennial rivers and minimal surface-water storage. The hydrography map (Figure 3.13) confirms that the wider Omaheke region is dominated by ephemeral pans, shallow depressions, and intermittent drainage channels, none of which provide reliable water for domestic or construction use.

Rainfall infiltrates rapidly through the sandy soils, feeding localised shallow groundwater systems that are the primary source of water for livestock, boreholes, and household use. Evaporation rates far exceed rainfall, meaning any standing water disappears within hours to days.

Hydrological implications for the service station include:

- Strict compliance with groundwater abstraction permits
- Careful siting of fuel-handling areas to avoid infiltration risk

- Stormwater design that disperses runoff without causing gullying
- Protection of existing boreholes, which are critical community assets

The ephemeral drainage features visible in Figure 3.13 indicate that even though flows occur rarely, sudden storm events can generate short-lived flash floods, requiring the facility's layout to avoid natural drainage lines.

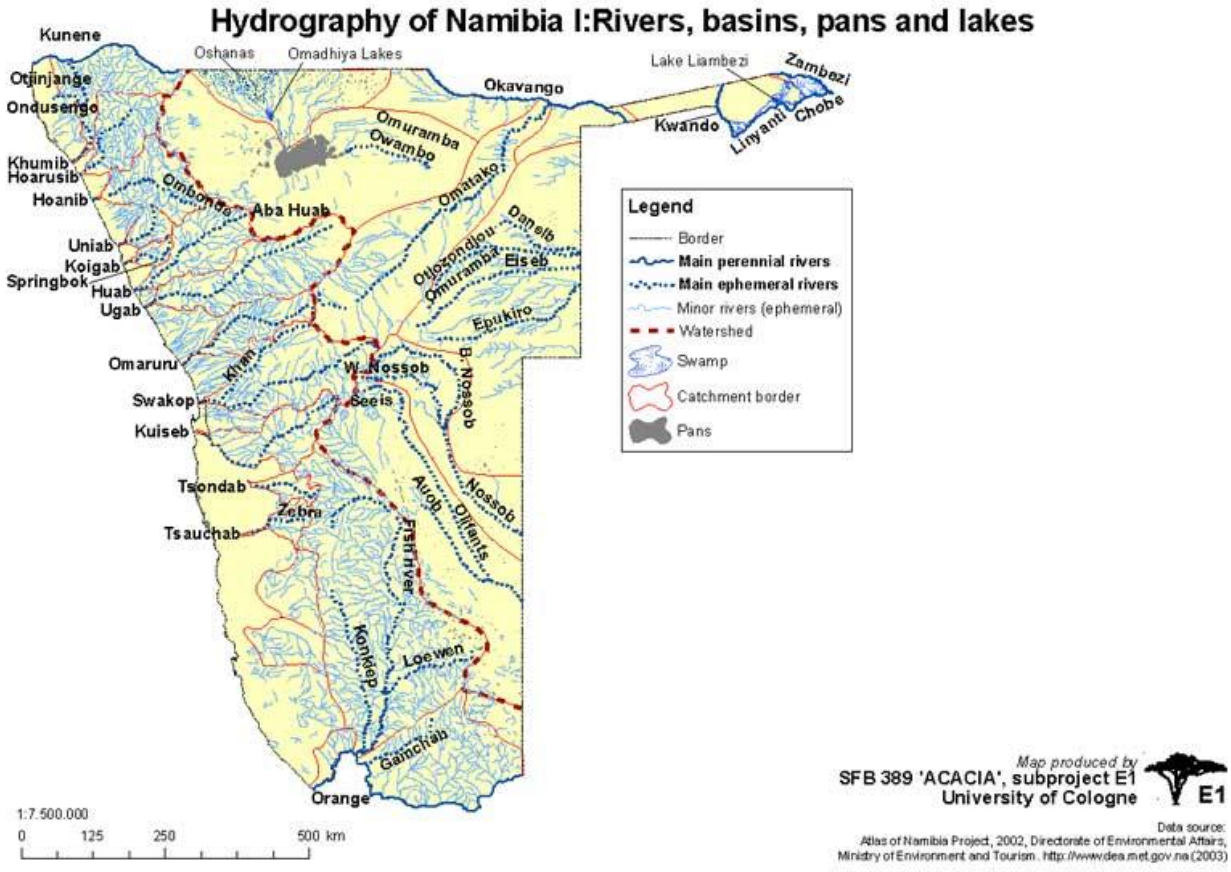

Figure 3-13: Hydrography of Namibia – Rivers, Basins, Pans and Lakes

3.7 FLORA, VEGETATION STRUCTURE AND BIODIVERSITY

Aminuis is situated within the Tree-and-Shrub Savanna Biome, with vegetation dominance shifting toward Kalahari shrubland. Compared to Namibia's north and northeast, biodiversity richness in Omaheke is moderate but ecologically important for rangeland functioning.

3.7.1 Vegetation Structure

Based on national vegetation mapping (Figure 3.14), the Aminuis area is dominated by:

- Kalahari shrubland

- Sparse grassland and shrubland mosaics
- Acacia (Vachellia) savanna

Key woody species include Vachellia erioloba (camelthorn), Vachellia reficiens, Senegalia mellifera, *Boscia albitrunca* and *Grewia* species. Vegetation density varies depending on past grazing pressure and rainfall. Shrub thickening is common in the region and reflects long-term changes in fire frequency and grazing intensity.

This vegetation type is not highly sensitive, but:

- Certain trees (e.g., camelthorn) are protected under the Forestry Act.
- Drainage-line vegetation must be avoided to prevent habitat fragmentation.

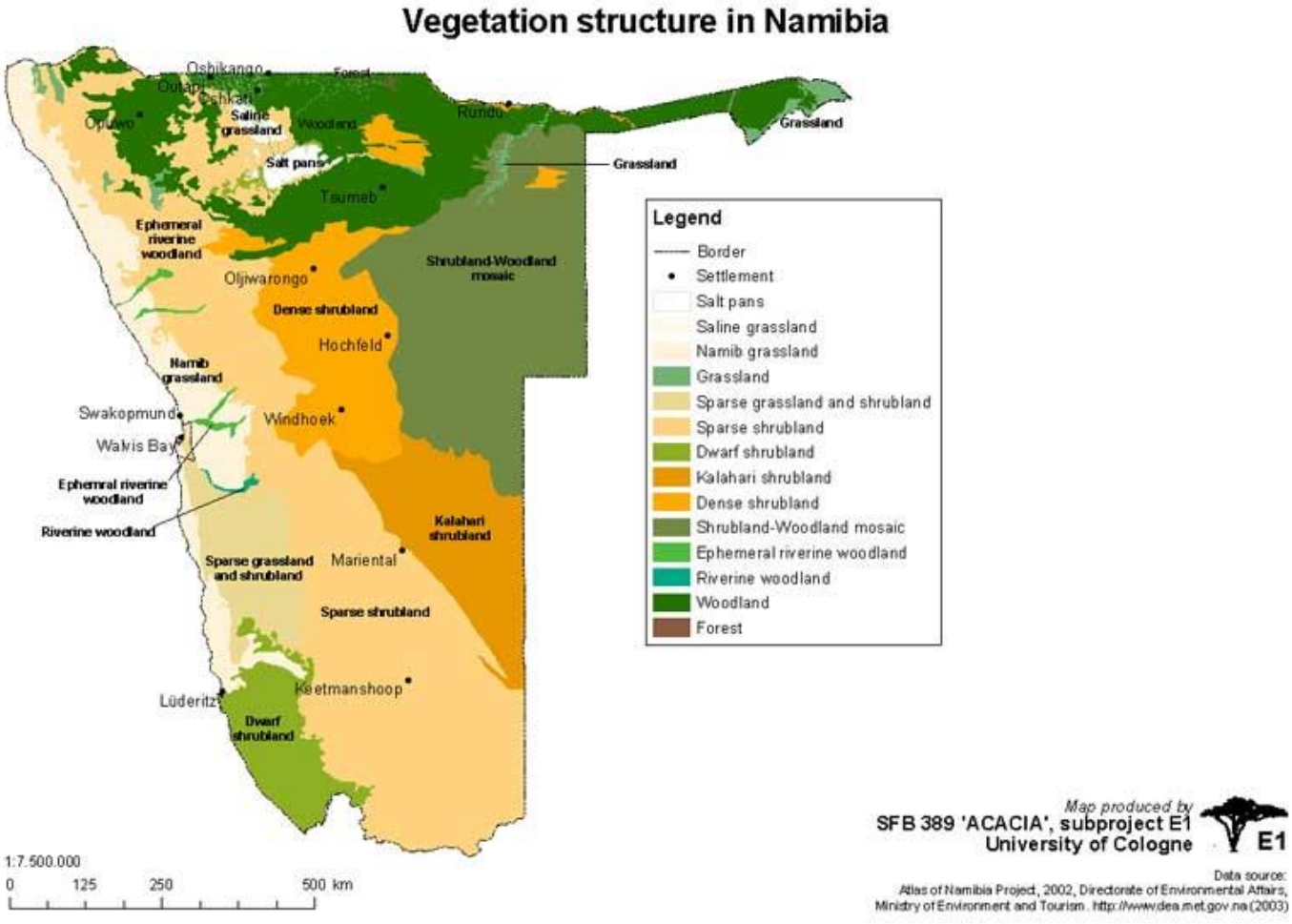

Figure 3-14: Vegetation Structure in Namibia

3.7.2 Floral Diversity

The plant diversity maps (Figure 3.15) show that the broader Omaheke zone supports 100–150 species, increasing in areas with seasonal water availability. While diversity is lower than the north, the vegetation still includes:

- Drought-tolerant shrubs
- Annual grasses after rain
- Succulent species in microhabitats
- Savanna woodland species in deeper sands

No endemic or highly restricted species are expected in Aminuis. The flora is typical of Kalahari ecosystems.

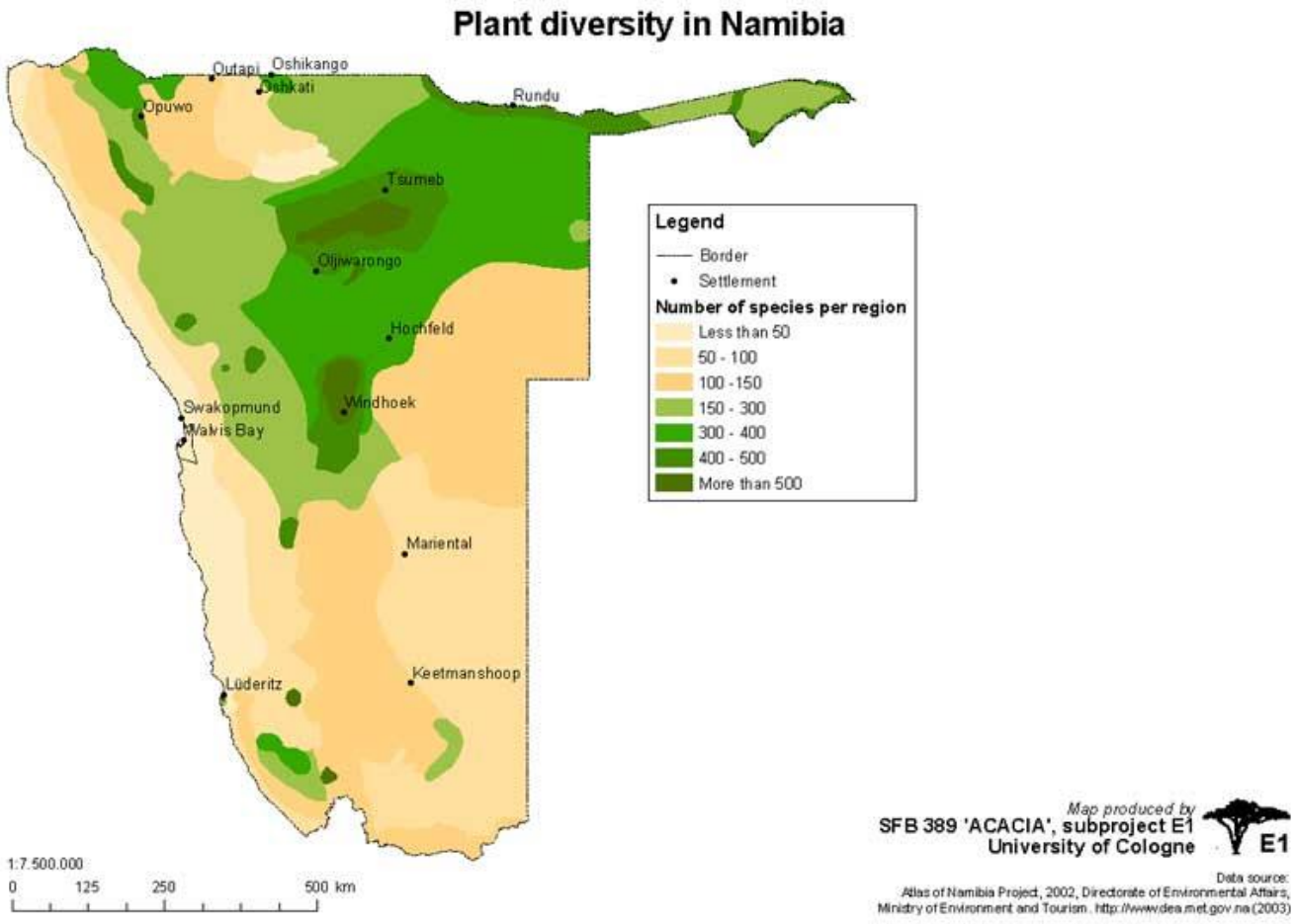

Figure 3-15: Plant Diversity in Namibia

3.7.3 Important Plant Species

Key plants of environmental relevance include:

- Camelthorn (Vachellia erioloba) – Protected, must not be removed without a permit.
- Shepherd's tree (Boscia albitrunca) – Culturally important and protected.
- Devil’s Claw (Harpagophytum spp.) – Occasional occurrence; harvesting regulated under ABS rules.
- Acacia shrub species – Ecologically important for browsing and soil stabilisation.

While Welwitschia and Mopane do not naturally occur here, protected tree species may be present and must be surveyed before clearing.

3.7.4 Grass Cover and Ground Layer

Grass cover in Aminuis is sparse to moderate (Figure 3.16), depending on rainfall and grazing intensity. Common grasses include *Stipagrostis*, *Schmidtia*, *Aristida* and seasonal annuals.

Environmental implications:

- Sparse grass cover increases wind erosion potential during site clearing.
- Grass recovery after disturbance can be slow under low rainfall conditions.
- Well-managed rehabilitation is essential for reinstating ground cover after construction.

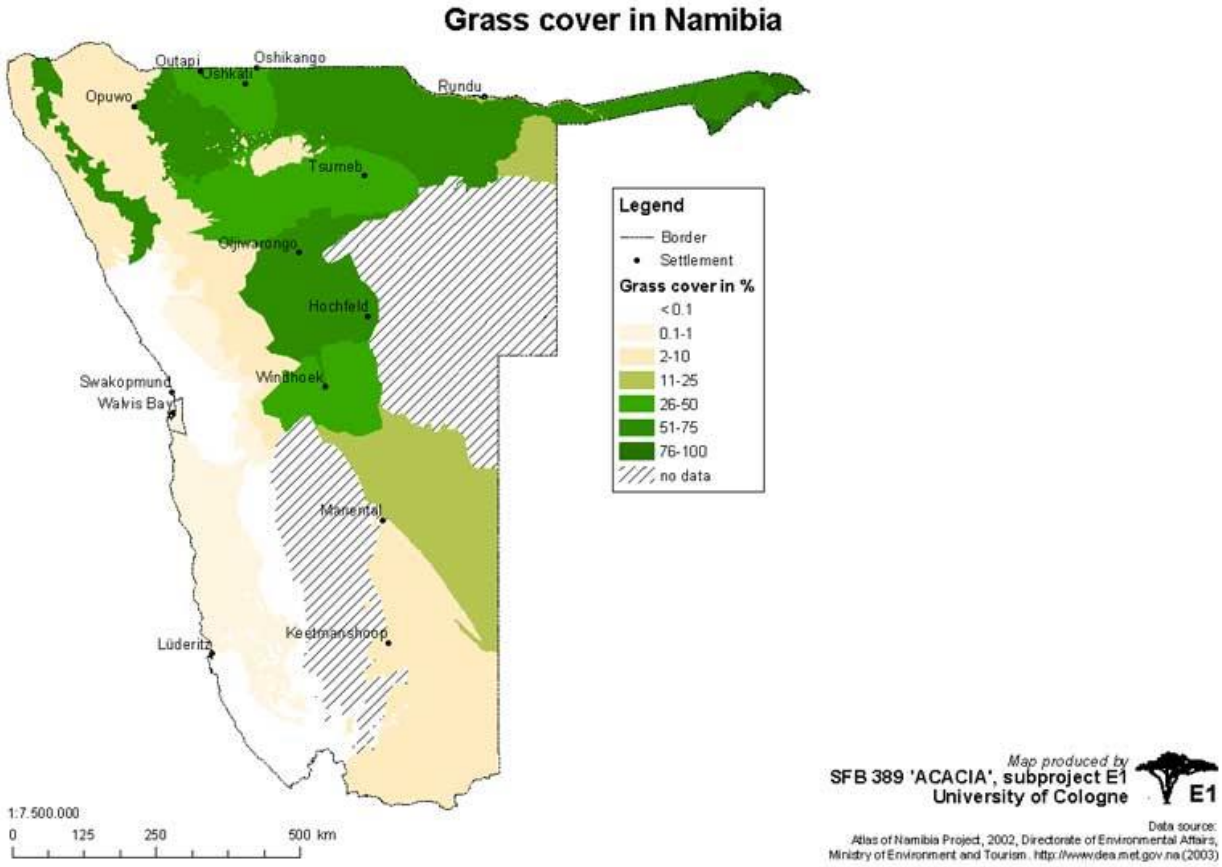

Figure 3-16: Grass Cover in Namibia

3.7.5 Biome Context and Conservation Importance

As shown in Figure 3.17, Aminuis falls within the Tree-and-Shrub Savanna Biome, one of Namibia's major ecological zones.

Conservation significance includes:

- High value for livestock-based livelihoods
- Habitat for generalist wildlife species
- Important corridors for bird movement across savanna systems
- Susceptible to bush encroachment, a national management concern

The vegetation is generally resilient but requires careful disturbance management.

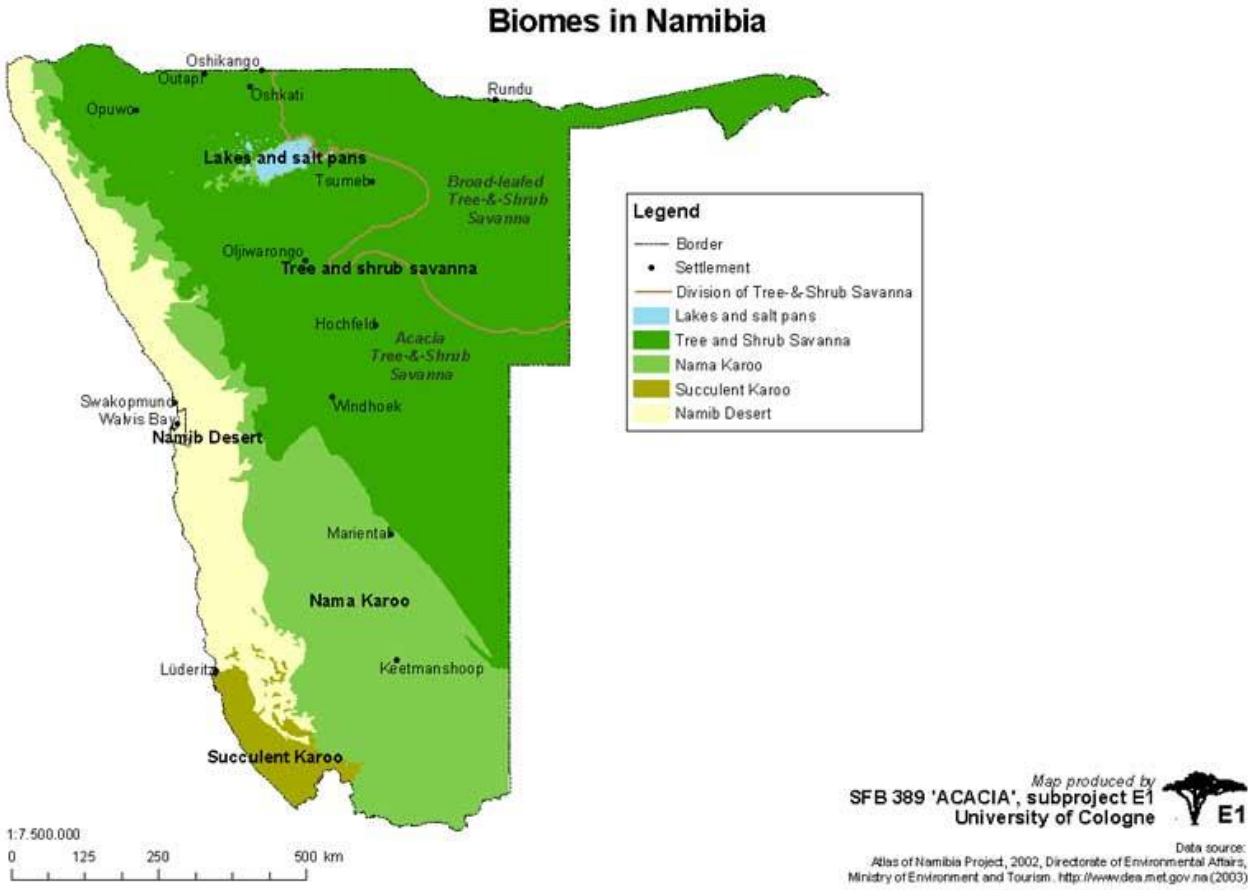

Figure 3-17: Biomes of Namibia

3.7.6 Relevance to the EIA

Vegetation-related sensitivities for the proposed service station include:

- Avoidance of protected trees during siting.
- Minimising shrub clearing to reduce soil erosion.
- Proper disposal of vegetation waste to prevent informal wood harvesting.
- Rehabilitation of disturbed soils to restore ground cover.

Given the small footprint, impacts can be effectively mitigated.

3.8 FAUNA

Aminuis supports moderate faunal diversity typical of Kalahari savanna ecosystems. No rare or range-restricted species are expected, but the area is used by mobile wildlife that moves across communal grazing lands.

3.8.1 Mammals

Mammal richness in Omaheke (Figure 3.18) ranges between 61–75 species. Common species include:

- Kudu, steenbok, duiker
- Springbok and occasional oryx
- Jackal, brown hyena, caracal
- Small carnivores such as bat-eared fox

Livestock dominates the landscape, but wildlife still moves through unfenced rangelands.

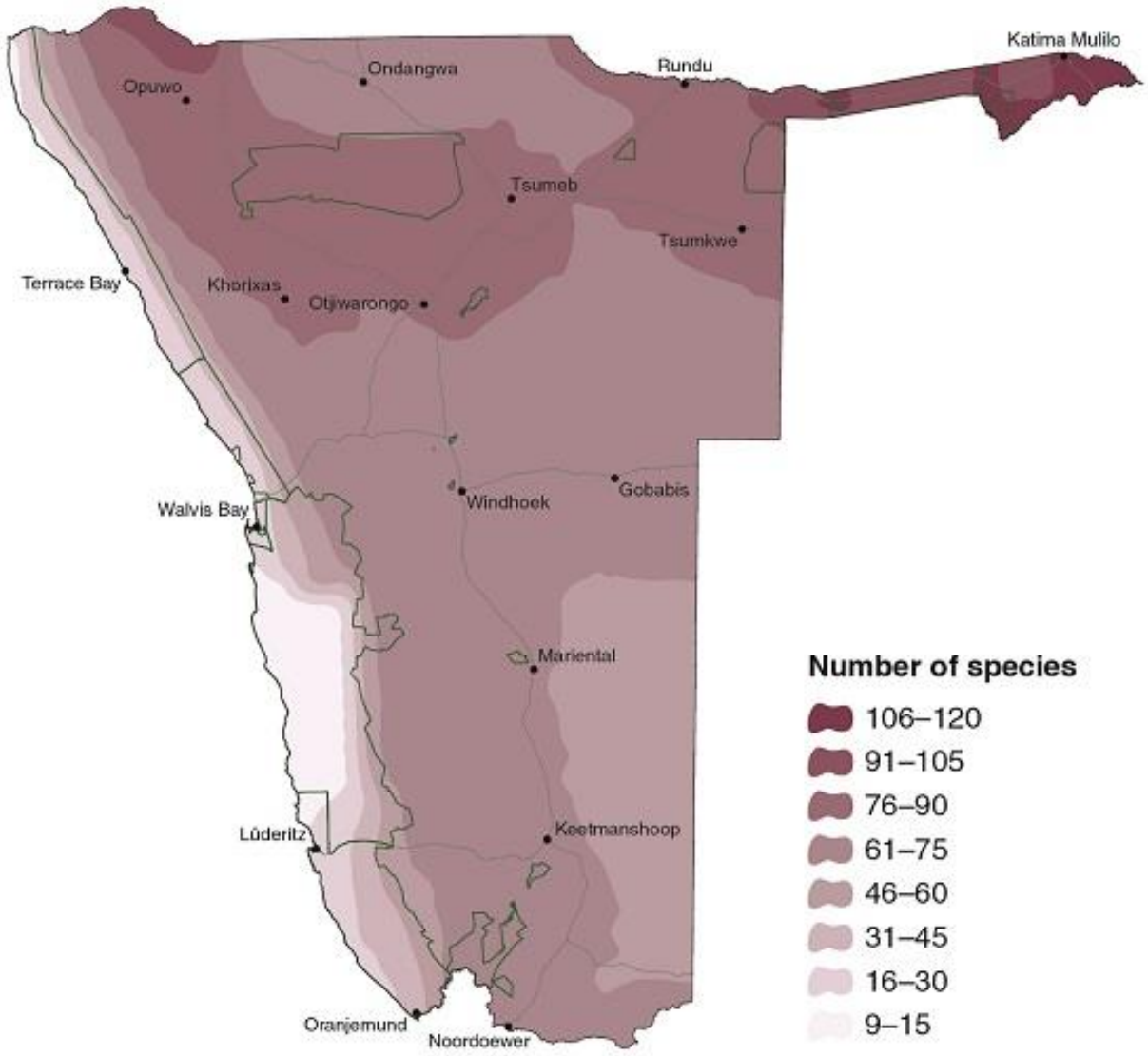

Figure 3-18: Mammal Species Richness in Namibia

3.8.2 Birds

Bird richness in the region ranges from 111–140 species (Figure 3.19). Typical species include:

- Raptors: Pale Chanting Goshawk, Tawny Eagle
- Ground birds: Korhaans, bustards
- Woodland birds: hornbills, rollers
- Seed-eaters and grassland finches

The site is not within an Important Bird Area, but care must be taken regarding lighting that may affect nocturnal species.

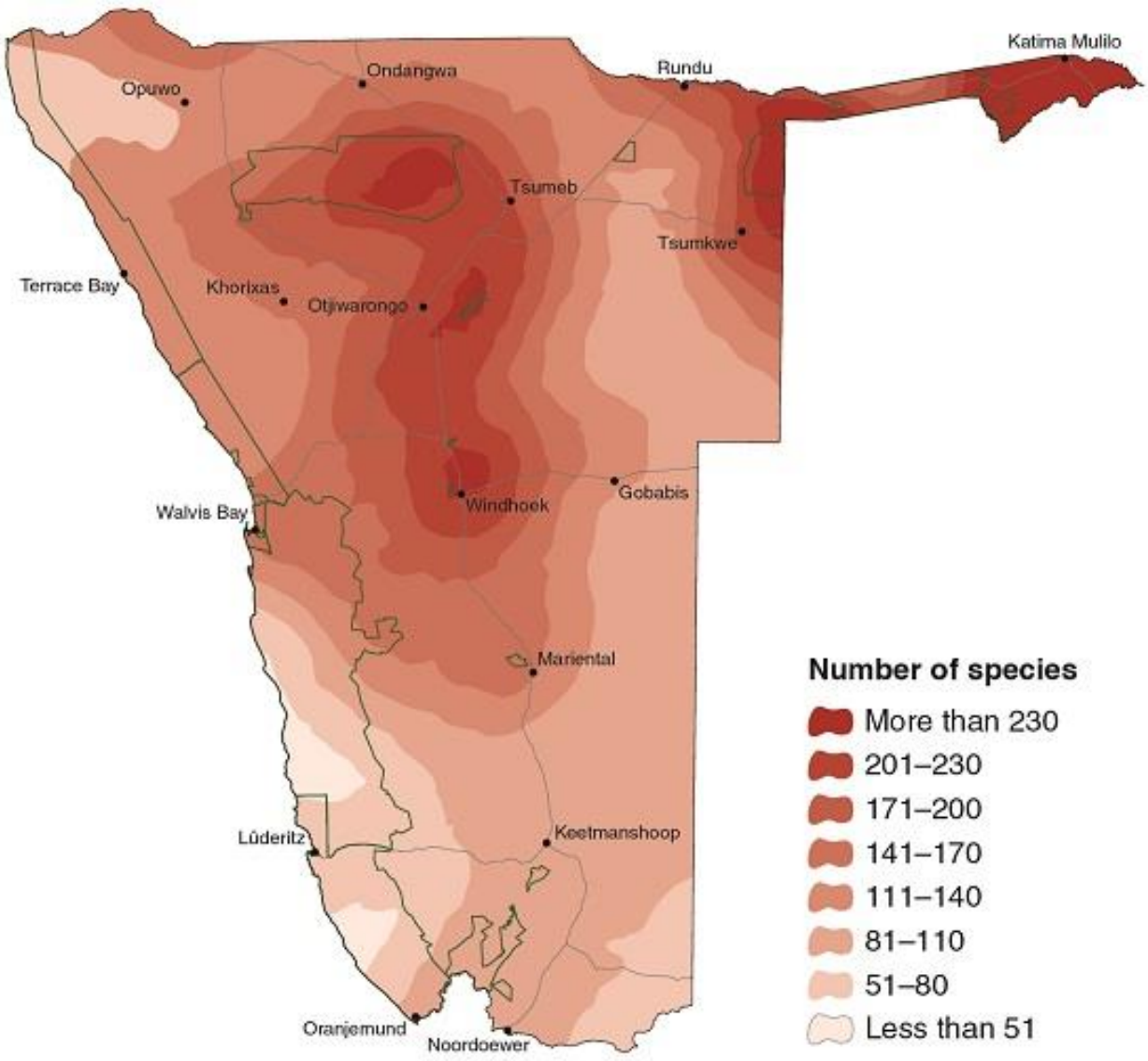

Figure 3-19: Bird Species Richness in Namibia

3.8.3 Reptiles

The sandy and shrub-dominated landscape supports 31–50 reptile species (Figure 3.20):

- Geckos, agamas
- Snakes such as puff adder, mole snake, and sand boa
- Skinks and other ground-dwelling reptiles

Hazardous species exist but are widespread and not conservation priorities.

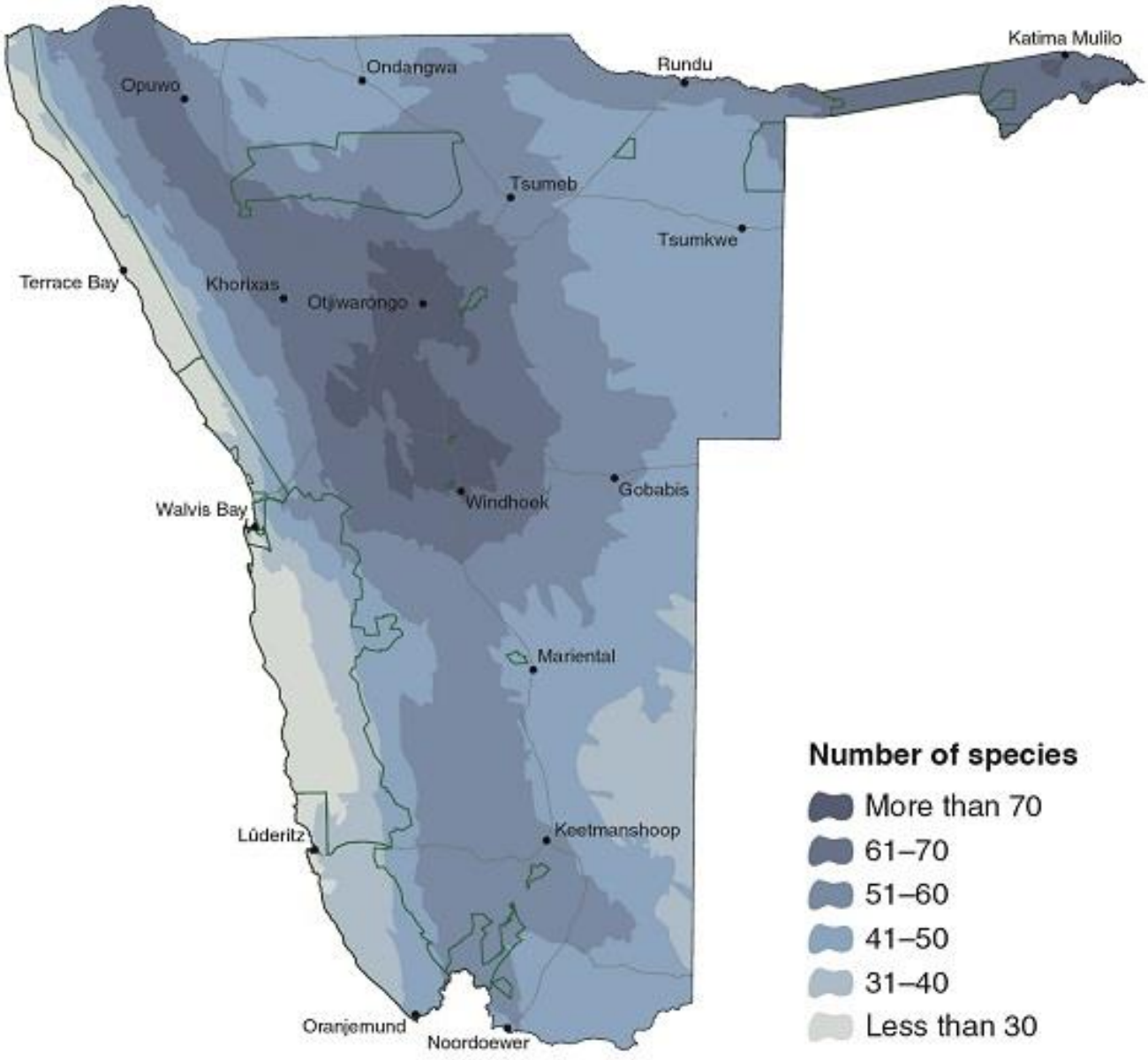

Figure 3-20: Reptile Species Richness in Namibia

3.8.4 Amphibians

Amphibian richness is low (9–15 species), reflecting scarce surface water. Occasional species include:

- Sand frogs
- Rain frogs
- Toads after heavy rains

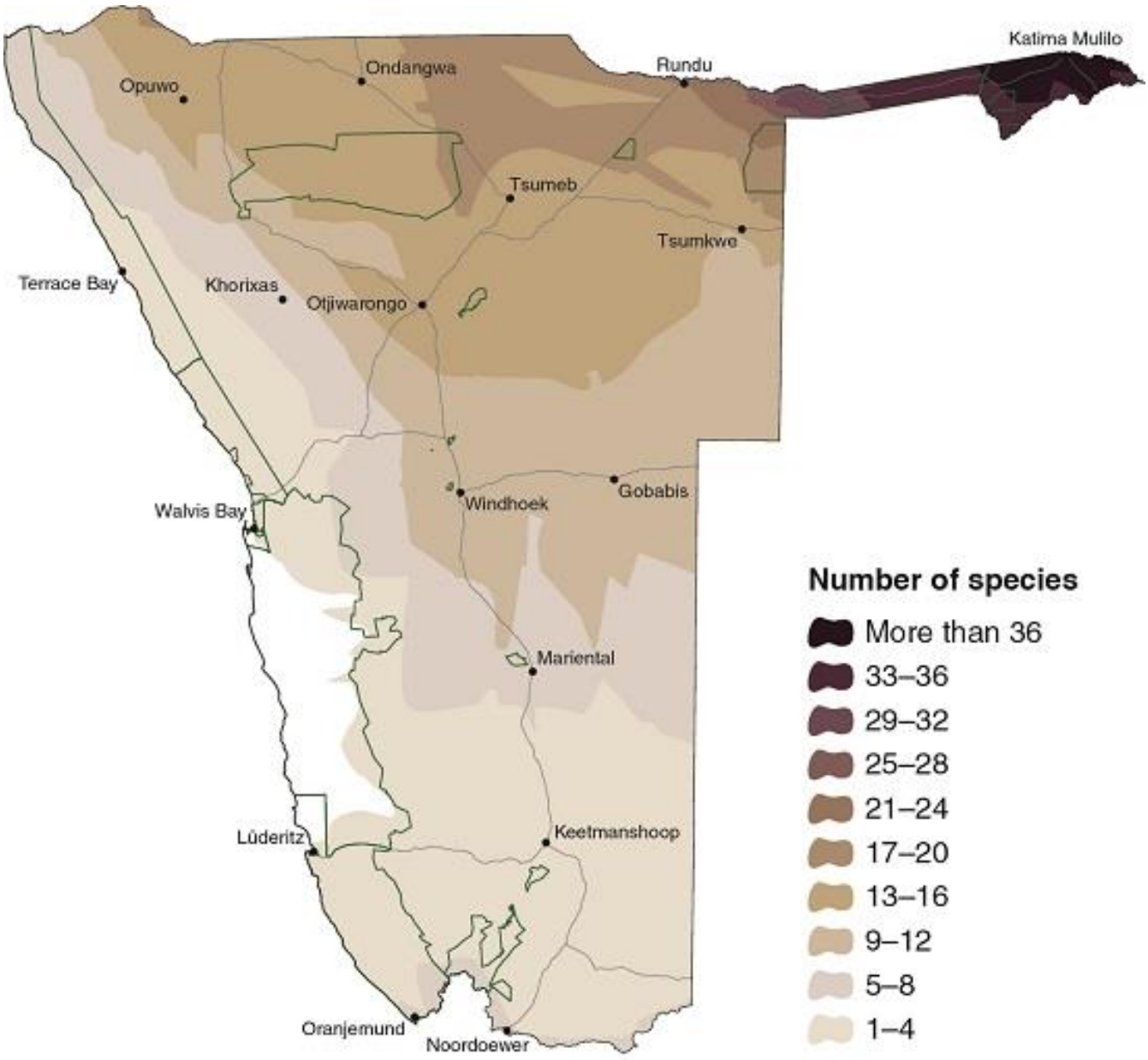

Figure 3-21: Amphibian Species Richness in Namibia

3.8.5 Freshwater Fish

The area supports 1–4 opportunistic fish species only during rare flooding events in ephemeral pans. No permanent aquatic habitats exist.

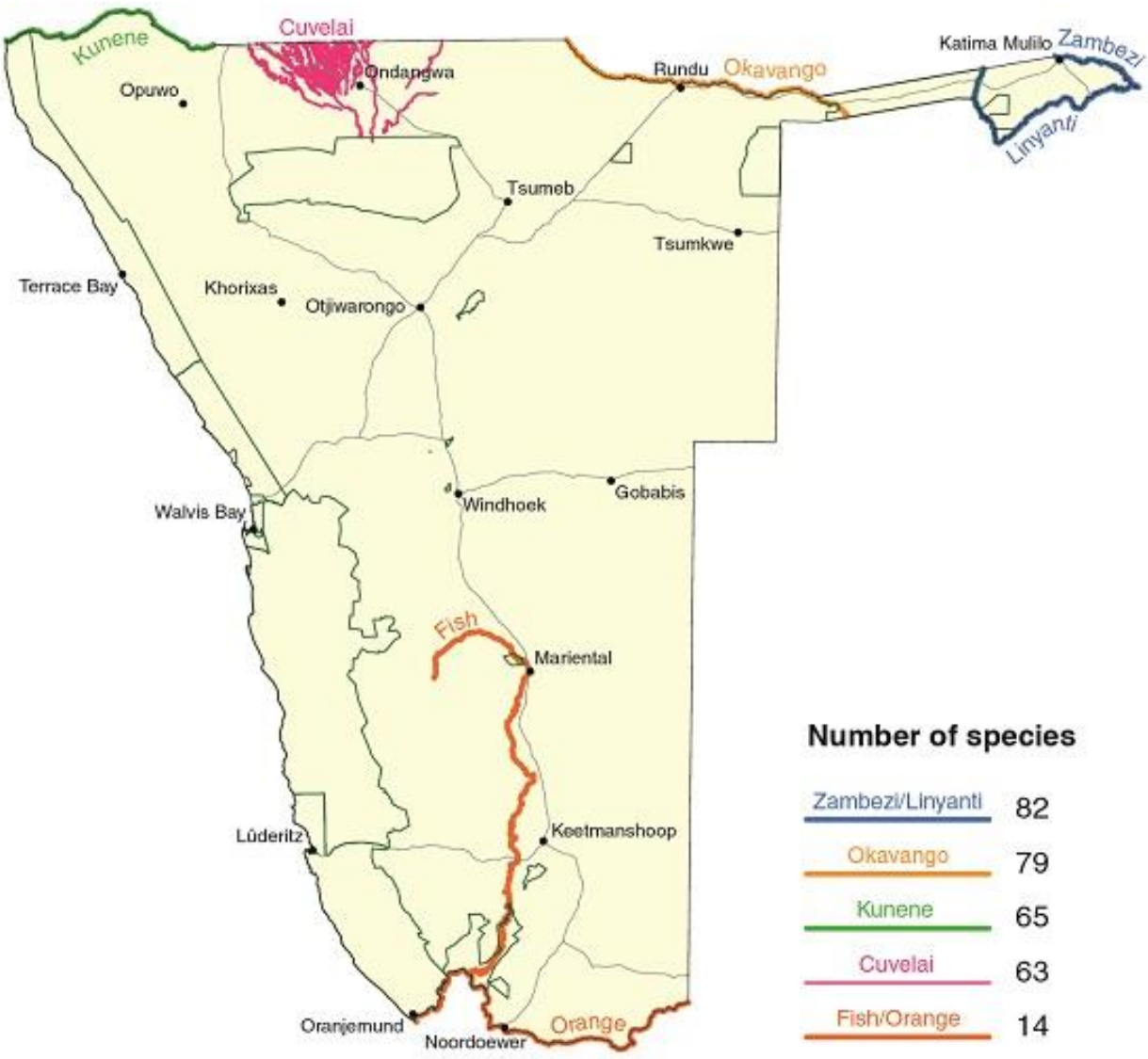

Figure 3-22: Fish Species Occurrence by Catchment

3.8.6 Invertebrates

Invertebrate diversity is moderate (Figure 3.23). Common groups include:

- Termites
- Harvester ants
- Toktokkie beetles
- Solifuges

- Pollinators (bees and wasps)

These taxa play important ecological roles but are not threatened.

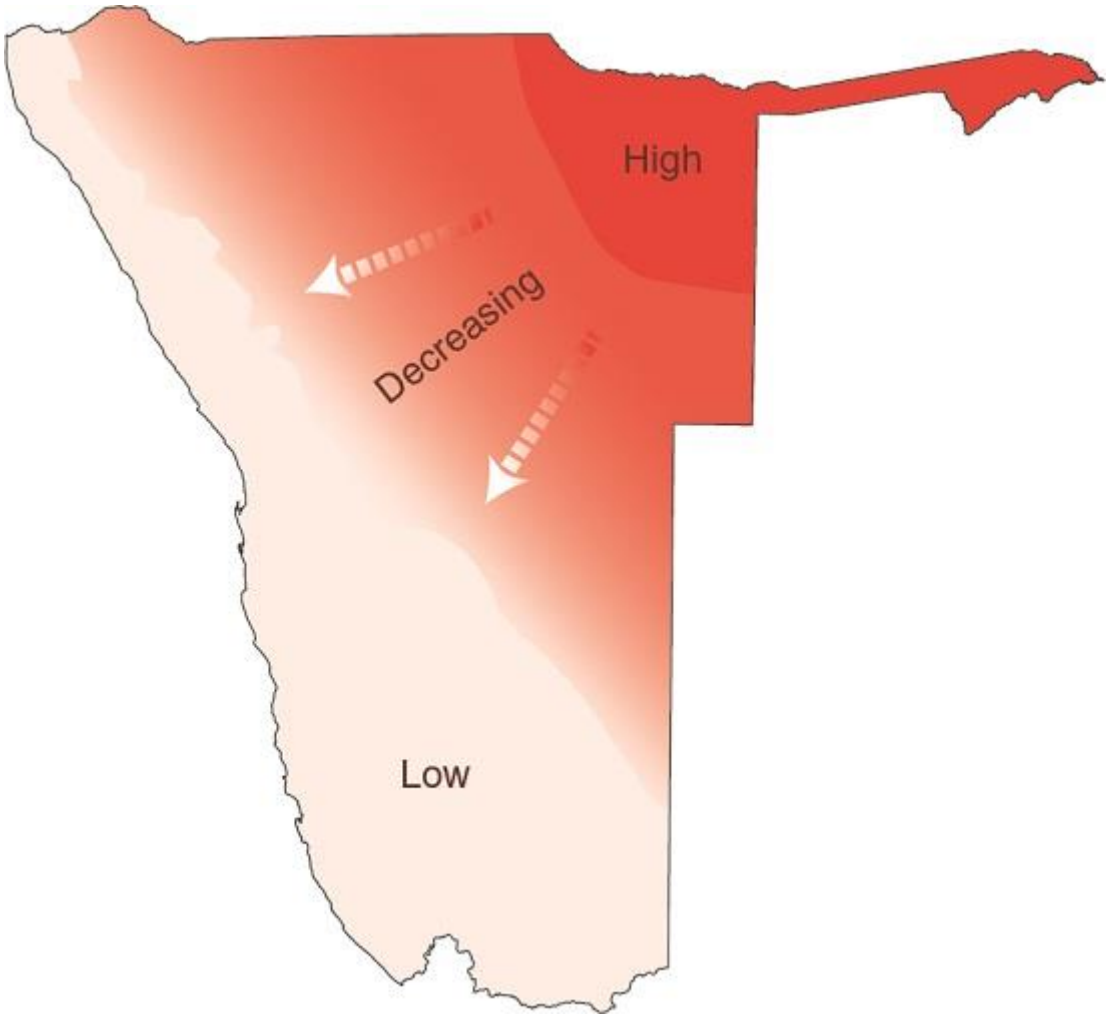

Figure 3-23: Invertebrate Richness Gradient Map

3.8.7 Faunal Sensitivity Summary

Key sensitivities:

- Light and noise pollution affecting birds
- Vehicle traffic affecting small mammals and reptiles
- Habitat disturbance causing soil erosion
- Waste attracting scavengers (jackal, hyena)

With proper EMP controls, faunal impacts are expected to be low and reversible.

3.9 HERITAGE AND ARCHAEOLOGICAL RESOURCES

The Aminuis settlement and surrounding communal lands fall within an area of low formal archaeological visibility, but high cultural-landscape significance, typical of the eastern Omaheke Region. Unlike the rock-art-rich escarpment areas of Kunene and Erongo, the Kalahari Sandveld has few stone outcrops and therefore limited potential for engravings or rock shelters. However, the area has a long pastoralist history, particularly associated with Ovaherero communities, historic cattle posts, and traditional movement routes leading toward Leonardville, Epukiro, and Botswana.

Although no declared heritage sites are recorded within the proposed project area, cultural features such as unmarked graves, abandoned homesteads, and historic kraal sites are common in rural Omaheke and may occur unexpectedly during development activities. For this reason, a precautionary approach and strict chance-find procedures are required.

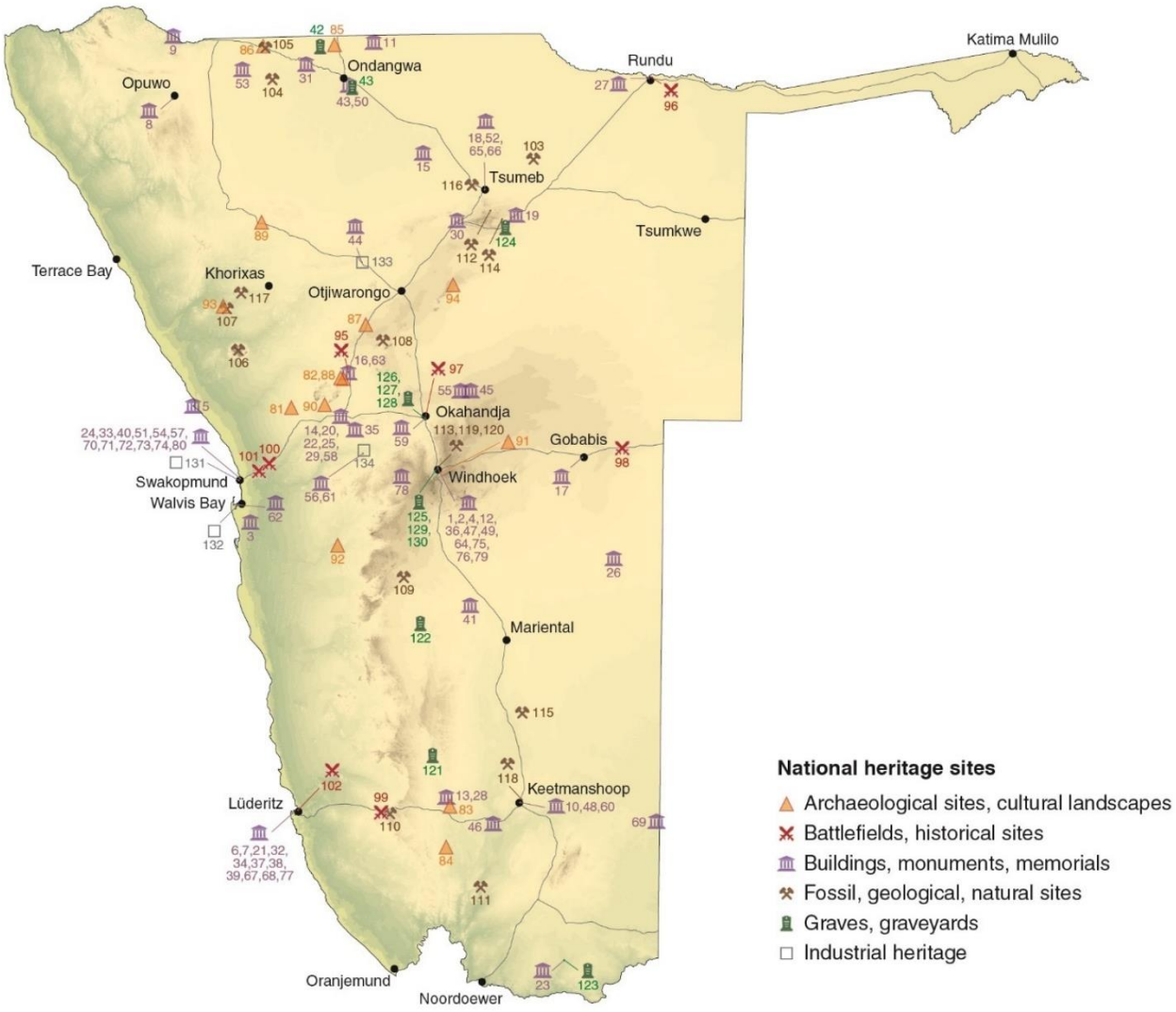

Figure 3-24: National Heritage Sites of Namibia

3.9.1 Archaeological Context of the Aminuis–Omaheke Landscape

Archaeological sensitivity in Aminuis is generally low, but several context-specific heritage features may still occur:

3.9.1.1 Stone Age Record (Low Probability)

Eastern Namibia's deep sands limit the preservation of artefacts, but isolated Early to Late Stone Age tools (flakes, scrapers) may be found on:

- deflated sandy surfaces,
- near calcrete patches,
- along pans or ephemeral drainage lines.

Artefact density is usually sparse but must still be treated as heritage.

3.9.1.2 Pastoralist and Pre-Colonial Features (Moderate Probability

Ovaherero traditional land-use patterns leave behind various cultural markers, including:

- Old cattle posts, stone enclosures, temporary kraals
- Historic footpaths connecting Aminuis → Epukiro → Leonardville
- Hunting shelters and thorn-bush stockades
- Former homestead sites

These features have high cultural value for local communities even if not formally protected.

3.9.1.3 Colonial & Farm-Era Heritage (Low to Moderate)

Since the 1900s, the Aminuis region has hosted:

- German/South African era farm outposts
- Old borehole sites and livestock-watering structures
- Family cemeteries or unmarked graves linked to early homesteads

Graves are the most sensitive heritage feature in this landscape.

3.9.1.4 Conclusion

Although Aminuis does not contain major declared heritage sites, the likelihood of undocumented pastoralist heritage and unmarked graves is moderate. Any ground disturbance, especially during trenching or excavation for underground fuel tanks, may expose buried cultural materials.

3.9.2 Palaeontological Sensitivity

The Aminuis area, dominated by Kalahari aeolian sands over calcrete and sandstone, is considered very low palaeontological sensitivity. Fossil potential is mainly limited to:

- root traces in calcrete deposits,
- minor carbonate structures,
- rare palaeo-surface impressions.

No nationally significant fossil-bearing formations occur in the area, and the risk of fossil discovery during construction is minimal.

3.9.3 Cultural and Living Heritage

The cultural landscape around Aminuis is active and lived, shaped by pastoralism, communal land management, and traditional authority structures. Potential living-heritage features include:

- Traditional cattle posts still in use
- Livestock routes used by herders
- Possible spiritual/ancestral sites (hillocks, trees, small groves)
- Unmarked burial sites associated with historic homesteads
- Seasonal gathering or meeting areas near boreholes

Engagement with the Aminuis Traditional Authority, settlement leadership, and elders is essential to identify culturally significant spaces.

3.9.4 Potential Heritage Sensitivities Relevant to Aminuis

The table below summarises the potential heritage sensitivities relevant to Aminuis

Table 3-4: Potential Heritage Sensitivities Relevant to Aminuis

Potential Resource	Sensitivity	Typical Location	Relevance for the Project
Stone artefact scatters	Low–Moderate	Calcrete patches, deflated sands	Possible exposure during excavation
Unmarked graves	Very High	Near abandoned kraals, homesteads	Automatic stop-work + NHC protocol
Pastoralist structures (posts, kraals)	Moderate	Near boreholes, livestock paths	Avoid disturbance, document
Cultural-use trees / spiritual sites	Moderate–High	Prominent camelthorn or androstachys trees	Avoidance recommended
Fossil traces	Very Low	Calcrete nodules	Unlikely but must be reported

This pattern aligns with the broader Ovaherero pastoralist cultural landscape, which is diffuse, undocumented, and sensitive to ground disturbance.

3.9.5 Heritage Management Requirements

3.9.5.1 Chance-Find Procedure

Immediate cessation of work is required if:

- graves or bones are found
- artefacts, stone tools or pottery are exposed
- unusual stone circles or historic structures appear
- fossil material is encountered

No object may be moved or collected.

3.9.5.2 Reporting Protocol

1. Secure area → notify Environmental Control Officer (ECO)
2. ECO → informs National Heritage Council (NHC)
3. Only accredited specialists may assess the find
4. Work resumes only after written clearance

3.9.5.3 Buffers and Protection

- 100 m buffer for graves
- 50 m buffer for cultural trees or kraals
- Rock or calcrete features must not be altered

3.9.5.4 Community Engagement

Engage:

- Aminuis Traditional Authority
- Village headmen around the site
- Local elders and families who know burial locations

This reduces the risk of disturbing sensitive areas.

3.9.6 Conclusion

Overall heritage sensitivity in Aminuis is low to moderate, with highly sensitive pockets related to pastoralist cultural heritage and unmarked graves. With strict adherence to chance-find procedures and respectful engagement, the project can proceed with minimal heritage risk.

3.10 ENVIRONMENTAL SENSITIVITY ASSESSMENT

The environmental sensitivity profile of Aminuis reflects the characteristics of the Kalahari Sandveld, communal grazing systems, shallow drainage lines, and sandy soils. Sensitivities differ significantly from rugged escarpment environments and are instead defined by:

- sandy, easily eroded soils,
- ephemeral hydrological features,

- protected trees (camelthorn, shepherd's tree),
- grazing-based ecological systems,
- active livestock–wildlife interface.

3.10.1 Sensitive Habitats

The Aminuis area includes:

3.10.1.1 Ephemeral Drainage Lines (High Sensitivity)

These seasonal flows support:

- thickened vegetation (Terminalia, Vachellia)
- wildlife movement
- recharge zones for boreholes

They must not be used for access, trenching, or infrastructure placement.

3.10.1.2 Kalahari Dune and Sandveld Plains (Moderate Sensitivity)

These plains are stable but highly prone to wind erosion when disturbed. Controlled site clearing is essential.

3.10.1.3 Protected Tree Habitats (High Sensitivity)

Relevant species:

- *Vachellia erioloba* (Camelthorn) – protected
- *Boscia albitrunca* (Shepherd's tree) – protected

These trees must be avoided during site layout.

3.10.1.4 Grazing and Rangeland Areas (Moderate Sensitivity)

While not ecologically unique, these areas are essential for:

- local livelihoods
- cattle movement corridors
- dry-season grazing patches

Development should minimise disruption to these functions.

3.10.2 Protected Areas and Conservation Priorities

Aminuis is not near parks or formal conservation areas; however:

- It is part of communal pastoralist landscapes
- Wildlife occasionally moves through the area (kudu, jackal, brown hyaena)
- The settlement hosts several bird-of-prey species sensitive to disturbance

While biodiversity importance is lower than in Kunene or Zambezi, the area still requires:

- controlled nighttime lighting
- minimisation of off-road movements
- proper waste control to avoid attracting scavengers

3.10.3 Vulnerable Flora and Fauna

Vulnerable components include:

3.10.3.1 Flora

- Camelthorn (protected)
- Shepherd’s tree (protected)
- Devil’s Claw (regulated harvesting)

3.10.3.2 Fauna

- Raptors (lappet-faced vulture, pale chanting goshawk)
- Small carnivores (brown hyaena, bat-eared fox)
- Burrowing species (meerkat, ground squirrels)

3.10.3.3 Habitat-Sensitive Zones

- tree clusters
- drainage lines
- old kraal areas with shade trees
- seasonal pans after rainfall

3.10.4 Hydrological and Soil Sensitivities

Key sensitivities:

3.10.4.1 Soil Erosion

- Kalahari sands blow away easily when exposed
- Avoid unnecessary clearing

3.10.4.2 Ephemeral Flood Zones

- Localised stormwater channels
- Low-lying depressions may flood briefly
- Keep infrastructure on elevated ground

3.10.4.3 Groundwater Protection

Aminuis relies entirely on boreholes, so:

- fuel and oil handling must be contained
- forecourt drainage must prevent infiltration of hydrocarbons
- underground storage must follow SANS standards

3.10.5 Cumulative Environmental Constraints

Moderate to high sensitivity occurs where:

- drainage lines,
- protected tree clusters,
- grazing corridors,
- cultural-use areas,
- erosion-prone sandy soils

overlap.

Low-sensitivity areas include previously disturbed plots and open sandy plains with few trees.

3.10.6 Implications for the Project

- Prefer construction on already disturbed or low-sensitivity land
- Avoid protected trees and drainage lines
- Maintain strict spill management and groundwater protection
- Minimise nighttime noise and lighting
- Implement dust suppression
- Maintain open communication with the Traditional Authority

With these measures, the service station will have low to manageable environmental impacts.

4 CHAPER FOUR: PUBLIC CONSULTATION

4.1 OVERVIEW

Public consultation for the Aminuis Service Station Project was carried out in accordance with the Environmental Management Act (No. 7 of 2007) and Namibia's EIA Regulations (GN 30 of 2012). These provisions require the proponent to meaningfully inform and engage Interested and Affected Parties (I&APs), ensuring that local perspectives, expectations and concerns are reflected in the environmental assessment.

The overall purpose of the consultation process was to:

- Provide clear and accessible information about the proposed service station
- Create transparent opportunities for community input
- Strengthen trust between the proponent, the Environmental Consultant and the Aminuis community
- Identify socio-economic, environmental and land-use concerns early
- Ensure the project reflects the needs and priorities of the settlement

The engagement approach prioritised fairness, inclusivity and culturally appropriate communication suited for rural settings such as Aminuis.

4.2 CONSULTATION METHODS AND PROCESS

A mix of statutory and supplementary methods was used to reach residents, authorities, service providers and institutions within the Aminuis Settlement and surrounding villages.

4.2.1 Background Information Document (BID)

A project-specific Background Information Document was compiled and circulated physically and digitally. The BID provided:

- A simple explanation of the proposed service station
- The EIA and EMP process
- Potential environmental and socio-economic impacts
- How stakeholders could register as I&APs
- Contact details of the Environmental Assessment Practitioner (EAP)

In compliance with legal requirements notices were published in two widely circulated newspapers to announce the public participation process and invite comments.

Table 4-1: Newspaper Advertisements

Newspaper	Coverage	Language	Publication Dates
The Confidante	National	English	08 -30 September 25
Windhoek Observer	National	English	08 – 30 September 25
Extended advertisement	National	English	17 – 30 November 25

These notices communicated:

- Start of the EIA process
- Nature and location of the proposed service station
- Opportunity to register as an I&AP
- Venue, time and date for the public meeting

4.2.2 Public Notices and On-Site Announcements

Site notices were erected at high-visibility public locations across Aminuis, such as Aminuis Clinic, Aminuis Settlement Office, community gathering points, etc. These notices announced the commencement of the EIA, the project description and public meeting date and venue. These notices ensured that community members without newspaper access or internet connectivity were still informed. The images below show some places where public notices were put

Image 4-1: Public Notices

Image 4-2: Public Notices

4.2.3 Public Meeting

A public meeting was organised as follows:

- **Date:** 21 September 2025
- **Time:** 14h00

- **Venue:** Aminuis Settlement Office

The images below show the public meeting as well as other engagements that were carried out with other stakeholders.

Image 4-3: Public meeting and Community Engagements

4.3 SUMMARY OF KEY ISSUES RAISED DURING PUBLIC CONSULTATION

All inputs from the BID distribution, site visits, public meeting and personal engagements were consolidated into thematic categories.

Table 4-2: Summary of Issues Raised by Stakeholders

Theme	Issues Raised
Economic	Strong demand for local employment; expectation that unskilled and semi-skilled labour be sourced from Aminuis residents; desire for small business opportunities around the station (vendors, car wash, tyre repair).
Health & Safety	Need for proper waste-handling facilities; concerns over possible pollution; expectations for strict fuel-handling safety; worries about pedestrian safety near the C22 road.
Environmental & Ecological	Protection of grazing areas; water shortages and the need to avoid pressure on community boreholes; concern over dust, fuel spills and drainage issues.
Social & Communication	Request for regular updates; desire for clear communication regarding construction timelines; need for transparency about job opportunities.

These concerns directly informed the impact assessment and mitigation measures in Chapter 5 and the Environmental Management Plan (EMP).

4.4 CONCLUSION ON PUBLIC CONSULTATION

The consultation process for the Aminuis Service Station Project complies fully with the EMA (2007) and the EIA Regulations (2012). Despite low attendance at the statutory public meeting, all reasonable efforts were taken to ensure open, meaningful engagement.

The consultation process successfully:

- Increased public awareness of the project
- Provided fair opportunities for participation
- Recorded community concerns and expectations
- Integrated local knowledge into project planning
- Strengthened transparency and accountability

Stakeholder concerns have been incorporated into:

- Project design
- Impact assessment
- Mitigation measures
- The Environmental Management Plan (EMP)

The proponent commits to continued engagement with the Aminuis community throughout the construction and operational phases.

5 CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1 OVERVIEW

This chapter evaluates the potential environmental and socio-economic impacts associated with the proposed Aminuis Service Station Project. The assessment is undertaken in accordance with the Environmental Management Act (No. 7 of 2007), the EIA Regulations and relevant Namibian sectoral laws governing land use, water, waste, energy, health and safety. The analysis is also guided by the principles of sustainable development, ensuring that the project enhances local wellbeing while safeguarding environmental integrity.

Given the rural context of Aminuis — characterised by dispersed households, dependence on groundwater, and limited existing infrastructure — the sensitivity of the environment and community has been integrated into the impact-assessment approach. This ensures that the project's design anticipates challenges such as water scarcity, dust generation, heritage sensitivity, and community expectations around employment and safety.

To manage these risks and optimise project benefits, a dedicated Environmental Management Plan (EMP) has been prepared as part of this EIA. The EMP:

- Identifies potential impacts arising during construction and operation
- Assesses each impact in terms of magnitude, duration, intensity and likelihood
- Proposes practical mitigation and enhancement measures
- Establishes monitoring indicators and responsibilities
- Ensures compliance with national environmental standards

The EMP is intended as a living, adaptive management tool, enabling continuous improvements throughout the project's lifecycle. It will be updated in response to:

- Any modifications to project design or construction methodology
- Site-specific environmental or social conditions encountered during implementation
- New legislative or regulatory requirements
- Emerging issues raised by the Aminuis community, Traditional Authority or local institutions

Through this structured and responsive management approach, the proponent commits to implementing the Aminuis Service Station Project in an environmentally responsible and socially beneficial manner.

5.2 ASSESSMENT OF IMPACTS

This section outlines how the overall methodology to assessing the project's possible environmental and social impacts. Each potential impact must be assessed in order to properly evaluate its significance. The definitions and explanations for each criterion are set out below in Table 5-1.

Table 5-1: Assessment Criteria

Duration – What is the length of the negative impact?	
None	No Effect
Short	Less than one year
Moderate	One to ten years
Permanent	Irreversible
Magnitude – What is the effect on the resource within the study area?	
None	No Effect
Small	Affecting less than 1% of the resource
Moderate	Affecting 1-10% of the resource
Great	Affecting greater than 10% of the resource
Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance?	
Local	In the immediate area of the impact
Regional / National	Having large scale impacts
International	Having international importance
Type – What is the impact	
Direct	Caused by the project and occur simultaneously with project activities
Indirect	Associated with the project and may occur at a later time or wider area
Cumulative	Combined effects of the project with other existing / planned activities
Probability	
Low	<25%
Medium	25-75%
High	>75%

(***Adopted from ECC-Namibia, 2017)***

Table 5-2: Impact Significance

Class	Significance	Descriptions
1	Major Impact	Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non- compliance.
2	Moderate Impact	Impacts are long term, but reversible and/or have regional significance.
3	Minor	Impacts are considered short term, reversible and/or localized in extent.
4	Insignificant	No impact is expected.
5	Unknown	There are insufficient data on which to assess significance.
6	Positive	Impacts are beneficial

(Adopted from ECC-Namibia, 2017)

Table 5-3: Environmental Impacts and Aspects Assessment

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
Topography & Landscape	Landform	Minor alteration of local topography due to levelling & earthworks	Construction	Short-term	Low	Local	Direct	Probable	Low
Visual Landscape	Visual character	New built structures may introduce moderate visual contrast in a rural landscape	Operations	Long-term	Moderate	Local	Direct	Probable	Moderate
Soil	Topsoil	Loss of topsoil during site clearance & compaction	Construction	Long-term	Low	Local	Direct	Highly probable	Moderate
Soil	Hydrocarbons	Potential contamination from fuel leaks, oil spills, waste oil	Operations	Long-term	Moderate	Local	Direct	Probable	Moderate
Land Use	Settlement land	Conversion of undeveloped communal	Construction	Long-term	Low	Local	Direct	Probable	Low

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
		land to a service-use facility							
Socio-Economic Value	Livelihoods	Land utilisation introduces a new economic anchor node	Operation	Long-term	High	Local/Regional	Indirect	Probable	Moderate Positive
Groundwater	Contamination	Fuel leakage, spillages, and tank failure pose a risk to shallow aquifers	Operations	Long-term	High	Local	Direct	Improbable (with mitigation)	Moderate
Groundwater	Water demand	Increased abstraction for cleaning, sanitation & construction	Construction /Operations	Long-term	Moderate	Local	Direct	Probable	Moderate
Surface Water	Stormwater runoff	Runoff from paved areas carrying hydrocarbons	Operations	Short-term	Moderate	Local	Direct	Probable	Moderate
Surface Water	Sedimentation	Soil disturbance leading to sediment transport during rainfall	Construction	Short-term	Low	Local	Direct	Improbable	Low

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
Air Quality	Dust emissions	Dust generated during site clearance and vehicle movement	Construction	Short-term	Low	Local	Direct	Probable	Moderate
Air Quality	Vapour emissions	Minor hydrocarbon vapours during fuel dispensing	Operations	Long-term	Low	Local	Direct	Probable	Low
Noise	Operating noise	Noise from fuel pumps, vehicles & generators	Operations	Long-term	Low	Local	Direct	Probable	Low
Flora	Vegetation clearing	Loss of shrubs, grasses & possible loss of mature protected trees	Construction	Short-term	Moderate	Local	Direct	Highly probable	Moderate
Flora	Invasive species	Spread of Prosopis & other invasives due to disturbance	Construction & Operations	Long-term	Low	Local	Direct	Probable	Low
Fauna	Habitat disturbance	Noise, human activity &	Operations	Long-term	Low	Local	Direct	Probable	Low

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
		lighting may deter wildlife							
Fauna	Roadkill	Minor increase in wildlife–vehicle collisions	Operations	Long-term	Low	Local	Direct	Improbable	Low
Human Safety	Fire & explosions	Risk of fire associated with fuel handling	Operations	Long-term	High	Local	Direct	Improbable (with controls)	Moderate
Community Safety	Increased movement	Increased traffic & presence of workers in settlement	Construction & Operations	Long-term	Moderate	Local	Direct	Probable	Moderate
Employment	Temporary jobs	Temporary jobs created during construction	Construction	Short-term	Low	Local	Direct	Probable	Moderate Positive
Employment	Permanent jobs	Ongoing operational employment opportunities	Operations	Long-term	Moderate	Local	Direct	Highly probable	Moderate Positive
Local Economy	SME activity	Increased local procurement, micro-traders, SMEs	Operations	Long-term	High	Local	Direct	Highly probable	High Positive

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
Mobility & Access	Fuel access	Reduced travel distance & improved mobility	Operations	Long-term	High	Regional	Direct	Highly probable	High Positive
Community Wellbeing	Social services	Improved access for clinics, police & emergency vehicles	Operations	Long-term	Moderate	Local/Regional	Direct	Probable	Moderate Positive
Cultural Heritage	Chance finds	Possible disturbance of undocumented graves or materials	Construction	Long-term	Low	Local	Direct	Probable	Moderate