Environmental and Social Impact Assessment (ESIA) for Ruacana South Water Supply Project Phase 1 in Omusati Region, Namibia

Environmental & Social Scoping Report (ESSR) & Environmental and Social Management Plan (ESMP)

Project Reference No.: P-NA-E00-005

MEFT App No.: 230930002191

January 2024

Document Details

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Project Name	Environmental & Social Impact Assessment (ESIA) for Ruacana South Phase 1 Water Supply Project in Omusati Region, Namibia			
Document Type	Environmental & Social Impact Assessment (ESIA): Environmental & Social Scoping Report (ESSR) and Environmental and Social Management Plan (ESMP)			
Client	Ministry of Agriculture, Water and Land Reform (MAWLR) Enquiries: Mr. Victor Slinger Tel No.: +264 81 140 0086 Email: Victor.Slinger@mawlr.gov.na			
Design / Consulting Engineer	Lund Consulting Engineers cc Enquieries: Tel No.: Email:			
Lead Environmental Consultant	D&P Engineers and Environmental Consulting CC Enquiries: Mr. T. E. Kasinganeti / Dr. L. Zvobgo Tel No.: +264 61 302 672 Email: info@dpe.com.na			
Date of Release	September 2023			
	Name	Signature	Revised Dates	
Lead Author	Dr. Luckson Zvobgo		20 January 2023	
Contributing Authors	Ms. Kristian Shiwayu &			
	Mr. Adiel Mudzanapabwe			
Internal Reviewer	Mr. Tendai E. Kasinganeti		20 January 2023	
AfDB Reviewers	Mr. Onesmo Mazarure			
	Shawo Mwakilama			

NB: The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purposed of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.

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ACRONYMS

Terms	Definition
AfDB	African Development Bank Group
AMSL	Above Mean Seal Level
ARAP	Abbreviated Resettlement Action Plan
BID	Background Information Document
CBOs	Community-Based Organizations
CEB	Cuvelai-Etosha Basin
DEAF	Department of Environmental Affairs & Forestry
DPE	D&P Engineers and Environmental Consultants
DWSSC	Directorate of Water Supply & Sanitation Coordination
EA	Environmental Assessment
EAP	Environmental Assessment Practitioners
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESR	Environmental Scoping Report
ESSR	Environmental & Social Scoping Report
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Safeguards
GHGs	Greenhouse Gases
GRM	Grievance Redressal Mechanism
GRN	Government of the Republic of Namibia
HDPE	High Density Polyethylene
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
KAZA TFCA	Kavango-Omusati Trans frontier Conservation Area
kN/m	Kilo newton-meter
kPa	Kilo Pascal
LCE	Lund Consulting Engineers
LDPE	Low Density Polyethylene
m/s	Meter per second
MAWLR	Ministry of Agriculture Water and Land Reform
MCC	Motor control centres
MEFT	Ministry of Environment, Forestry and Tourism
NHBRC	National Home Builders Registration Council
NDP5	Namibia's 5th National Development Plan
NGL	Normal Ground Level
NGOs	Non-governmental Organisations
NHC	National Heritage Council

Terms	Definition
NEMA	Namibia Environmental Management Act of 2007
NWSSP	Namibia Water Sector Support Program
OS	Operation Safeguard
PCDP	Public Consultation and Disclosure Plan
PLC	Programmable Logical Controller
PV	Photovoltaic (solar)
RTU	Remote terminal unit
SCADA	Supervisory control and data acquisition
SESA	Strategic Environmental & Social Assessment
SLS	Serviceability limit state
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
uPVC	Unplasticized Polyvinyl Chloride
VDCs	Village Development Committees
VSD	Variable speed drives

DEFINITION OF TERMS

Alternative - A possible course of action, in place of another that would meet the same purpose and need of the proposal.

Baseline - Work done to collect and interpret information on the condition/trends of the existing environment.

Biophysical - The part of the environment that does not originate with human activities (e.g., biological, physical and chemical processes).

Consultant (Environmental Assessment Practitioner) – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development, i.e., D&P Engineers and Environmental Consultants.

Cumulative Impacts / Effects Assessment - In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Decision-maker - The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.

Ecological Processes - Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).

Environment - As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water, and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.

Environmental & Social Management Plan (ESMP) - As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled, and monitored. According to the World Bank (2011), an ESMP is a detailed plan and schedule of measures necessary to minimize, mitigate any potential impacts identified by the ESIA.

Interested and Affected Party (I&AP) - In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.

Fauna and Flora - The animals and plants/vegetation found in an area.

Mitigation - The purposeful and practical implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.

Monitoring - Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).

Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. In other words, this refers to the institutions/departments that are directly involved in the implementation of the project or it can be defined as the organization (private or public sector) or individual intending to implement a development proposal, i.e., the Ministry of Agriculture, Water and Land Reform (MAWLR).

Public Consultation/Involvement - A range of techniques that can be used to inform, consult or interact with stakeholders and affected persons by the proposed activities.

Protected Area - Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.

Scoping - An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings, and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA/ESIA.

Significant impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Stakeholders – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

EXECUTIVE SUMMARY

OVERVIEW

The Government of Namibia is implementing the Namibia Water Sector Support Program (NWSSP), a project that is co-financed and supported by the African Development Bank. The executing agency is the Ministry of Agriculture, Water and Land Reform (MAWLR) Directorate of Water Supply & Sanitation Coordination (DWSSC). As part of the 25 sub-projects under the NWSSP, the upgrade of Ruacana South Water Supply Project Phase 1 Sub-Area 1 in Omusati Region receive funding to construct various water infrastructure including new extended pipeline, booster pumps, tanks and submains and other small, related water services such as meters (details of the exact infrastructure is provided in the ESIA report).

The aim of the project is to address the growing climate impacts on water resources which are threatening livelihoods of Namibians through limiting the available potable water. This undermines the country's development agenda expressed in different key national and international documents including the country's Vision 2030, the Constitution of Namibia, National Development Plans, Sustainable Development Goals and other international treaties such as the UN Right to Water. Thus, the Namibia's economic, environmental and social development agenda is continued to be threatened by water insecurity affecting the country. The proposed project is therefore, aimed to cover critical, urgent water supply infrastructure development and sanitation activities in different parts of the Omusati Region. The main aim is to provide potable water to thousands of Namibians in the project area.

At the completion of the project, the expected outcome is the increased water access in Omusati Region, addressing poverty and improve living standards and livelihoods of thousands of people through the provision of equitable, clean and accessible water. This achieves the national water security aim and the SDG 6 and regional goals.

Contextual Framework for the ESIA Summary

The RSWSP Project Area covers the Onesi, Ruacana and Tsandi Constituencies of the Omusati Region and the Opuwo Rural and Opuwo Urban Constituencies of the Kunene Region. A phased project development approach is being following for the implementation of the project with Phases 1 – 4 that are divided into Sub-Areas 1 – 4. The Phase 1 Sub-Area 1 is located towards the northwest of Namibia, south of the area around Ruacana, which is close to where the Kunene River forms the border between Namibia and Angola to the north. Being located along and across the border between the Kunene and Omusati Regions, the RSWSP lies to west of the Cuvelai Area, which in hydrological terms, being a transboundary wetland system, is termed the Cuvelai-Etosha Basin (CEB), or in Namibia, the Cuvelai Basin.

The summary of RSWSP Sub-Areas is presented below:

1. Sub-Area 1 – the portion between Olushandja and Ruacana;
2. Sub-Area 2 – the area south of the boundary of Sub-Area 1 up to Omakange, extending10 km either side of the tar road to Kamanjab (C35);
3. Sub-Area 3 – the western "arm" between Omakange and Opuwo, extending 10 km either side of the tar road to Opuwo (C41);
4. Sub-Area 4 – the eastern "arm" between Omakange and Okatseidhi, extending 10 km either side of the envisaged pipeline.

The summary Environmental and Social Management Plan (ESMP) will also be disclosed in accordance with the Bank's requirements as stipulated in the ISS/ESAP. In consideration of the project's likely impacts on the physical, biological and socioeconomic environment, in 2023, the MAWLR, Directorate of Water Supply & Sanitation Coordination of the Government of the Republic of Namibia (GRN) prepared an Environmental and Social Impact Assessment (ESIA) encloses the Environmental and Social Management Plan (ESMP) for the project. The two reports were prepared within the ambit of the Namibian regulatory framework and clearly identified the impacts and proposed measures that sought to avoid, minimize and offset adverse impacts while strengthening the project's socio-economic impacts.

According to the AfDB Environmental and Social Assessment Procedures (ESAP) embedded in the Integrated Safeguards System (ISS), the project has been categorized as a Category 1, which would thus require a full ESIA. In that respect therefore, the current ESIA report has been aligned to both the in-country environmental and social assessment requirements for the Project and the ADB's ISS for a robust environmental and social assessment of the lender's risk and the management thereof.

Scope of Works

Following the phased approach as indicated in the previous section, details of the four phases recommended for RSWSP implementation are:

1. Phase 1: Piped water supply to the area between the Olushandja Purification Plant in the east to the Ruacana Falls in the west;
2. Phase 2: Piped water supply to the area between Ruacana and Omakange, with a project area 10 km to either side of the C35 Main Road: Kamanjab – Ruacana;
3. Phase 3: Groundwater supply to the area from Omakange to Opuwo, with a project area 10 km to either side of the C41 Main Road: Omakange – Opuwo;
4. Phase 4: Piped water supply to the area from Omakange to Okatseidhi within a corridor extending 10 km to either side.

Phase 1 Sub Area 1: Comprises of the extension and upgrading and installation of new pipeline, booster pumps and reservoirs for the rural water supply network in Onesi and Ruacana South Constituencies. The Phase 1 will cover an area of approximately 46,500ha. Some of the areas covered in Phase 1 includes villages in Eunda in Onesi Constituency, Oshifo and the villages surrounding them, Ruacana South, and the villages close to the Angola/Namibia border.

The planned scope of works for upgrade of RSWSP Phase 1 Sub-Area 1 consists of the following:

i. Construction of a new booster pump station adjacent to NamWater's Olushandja – Ruacana Booster Pump Station at the junction of the C35 Kamanjab – Ruacana and the C49 Oshakati – Ruacana tar roads, to replace the existing pump station;
ii. A new 381 m^3 clean water balancing reservoir at the new pump station;
iii. Construction of a new bulk pipeline from the new pump station to the village of Engodo (approximately 16 km with diameters of 250 mm Class 16 (4.658 km) and 200 mm diameter Classes 16, 12 and 9 uPVC);
iv. Replacement of a portion of NamWater's existing 700 mm diameter AC, Class 12 pipeline from the Olushandja – Ruacana Booster Pump Station to the Ruacana Reservoir with 250 mm diameter Class 9 (5.013 km) and Class 6 (6.087 km) uPVC pipe;
v. Construction of 14 branch pipelines totaling approximately 89 km, with diameters between 63 mm (uPVC) and 110 mm (uPVC) with pressure classes between Class 6 and 16. A further

approximate of 41 km of 50 mm diameter Class 6 HDPE pipeline as envisaged for connections to the water meter manifolds;

vi. Construction of one ground level balancing reservoir, 22 elevated reservoirs (15 using LDPE storage tanks and 7 using pressed steel panels) and associated manifold private connections between Olushandja and Ruacana and Ruacana and Engodo.

vii. Installation of private manifold connections in communities consist of the following elements:

a. One metered connection per household or individual not part of a household
b. Connections would be clustered in a manifold-type configuration:
    1. Connections / manifolds would be clustered together in the area of a village;
    2. Water meters would be located above ground, protected in a steel cage housing up to six water meters;
    3. Multiple cages of six meters would be provided as/where required;
    4. Not more than four cages with six meters each would be installed at one connection point to the pipeline;
c. The manifold water meters would be supplied via an elevated reservoir which serves to provide reserve storage and a pressure break between the bulk pipeline and manifold connections, based on the following guidelines;
    1. Elevated reservoirs and manifolds were sited based on supply via own pipelines within a radius of 500 m (i.e. households / individuals were not expected to lay pipelines longer than 500 m);
    2. Storage provision would be sized for 24 hours' average daily demand at the end of the planning horizon (15 years);
        i. Multiples of 10 m3 polyethylene tanks would be used up to an including 40 m3 of required storage (4 tanks);
        ii. Volumes greater than 40 m3 would be provided via sectional steel reservoirs.
    3. Elevated reservoirs would be located on stands 6 to 9 m high, depending on the surrounding topography;
d. Each household or individual not part of a household would become a direct NamWater customer, with NamWater to read the water meter and bill that household / individual for their water consumption;
e. The DWSSC would provide all infrastructure up to the water meter of each household / individual and including a 2 m length of pipe to allow the filling of buckets / containers downstream of the water meter. Households / individuals would be responsible for laying a pipeline from "their" water meter to point of residence or use at their own time and cost. Due to the pressure break provided by the elevated reservoir, the system downstream would experience low pressures, thus allowing the use of low-pressure pipelines to reduce the pipeline costs to households / individuals.

Project Alternatives.

Two broad project alternatives were considered: (a) “no go” alternative and (b) upgrade of the existing pipeline and installation of related infrastructure. For the second alternative, design alternatives (technology, water sources, pipelines routes) was considered. The “No-Go” alternative was the option of not proceeding with the project activities, which typically implies a continuation of the status quo. This undermines the country’s social and economic development agenda and the global and regional effort to increase water access. Due to the project upgrades being done mainly along an existing infrastructure (for the second alternative), it is unlikely that design alternatives will significantly change to potentially impact the environment. The following characteristics was applied for the location alternative analysis for pipeline routing in new areas:

- Ecological Considerations: Less ecological disturbance through vegetation clearing.
- Possible permits required: pipeline route with less permits requirements should be prioritised.
- Land use suitability: The land, particularly the topography (flat ground) in the project area is suitable for the project infrastructure establishment.
- Considerations of the concerns of communities and stakeholders priorities. Water access is their top priority.
- Cost-Benefit analysis: A cost-benefit analysis for the project done by the Design Engineer and is deemed feasible.

Alternative one (no go) is clearly not recommended given challenges associated with lack of access to reliable potable water in the project area (health challenges, gender issues, socio-economic challenges). Alternative two for the upgrade of the existing pipeline to serve more people is supported by the proponent.

PROJECT AREA ENVIRONMENTAL AND SOCIAL BASELINE

Description of the Project Area

The project will increase water supply access to Omusati region of Namibia. Omusati is one of the 14 regions of Namibia, its capital is Outapi. The towns of Okahao, Oshikuku and Ruacana as well as the self-governed village Tsandi are situated in this region. In Omusati, RSWSP Phase 1 will cover Onesi, Ruacana and Tsandi Constituencies of the Omusati Region and the Opuwo Rural and Opuwo Urban Constituencies of the Omusati Region. The 2011 Population and Housing Census counted some 847 250 people in the Ohangwena, Omusati, Oshana and Oshikoto Regions, which comprised approximately 40% of Namibia's total population at the time. In 2016, the population of these four regions was estimated as 889 790. These four regions however comprise only 10% of the area of Namibia, resulting in population densities well above the national average.

The physical characteristics of the Omusati Region and Project Area are as follows:

Climate

The project area and Namibia are classified as Group B of the Köppen-Geiger Climate Classification, which contains dry, arid and semi-arid climates, characterised by actual precipitation being less than a threshold value set equal to the potential evapotranspiration. The generally warm (hot) and arid climate areas describe areas which lose more water via evapotranspiration than falls in precipitation.

Average rainfall in the project area varies from about 350 – 400 mm per annum in the east to about 300 – 350 mm per annum in the west and north-west of the Project Area. Water which enters the Project Area, either as rainfall or flowing surface water in the Cuvelai system, rapidly evaporates or seeps into the sandy ground. Average daily temperatures rise from about 17º Celsius in June and July to about 25º Celsius in October, November and December. These three months and September also have the highest maximum temperatures for the year of between 30º and 35º Celsius. Wind direction is highly variable and there is no prevailing wind direction across the Cuvelai Area, although an easterly component is slightly more frequent than from any other direction. Mean monthly values of humidity range from about 50%-80% in March, which is the most humid month in the Cuvelai, to less than 20% in September, which is the least humid month. At Opuwo, relative humidity is 32% in September and 82% in March.

Hydrology

The main water source in the Project Area is the Kunene River and the Calueque Dam in Angola. Water from the Calueque Dam in Angola is pumped a short distance over the watershed into the Calueque – Oshakati Canal which conveys this water into Namibia and then as far as Oshakati under gravity. There are other dams and surface rivers in the project area. The Omusati Region mostly the south-western parts and the Uukwaluudhi area north towards Ruacana are among the areas of the Cuvelai-Etosha Basin in the study area with best groundwater quality (class A and B). This also explains why currently there is reliance to groundwater in some parts of the project area. However, other portions of the project area have very poor underground water quality with significant concentrations of fluoride hence the need to include all the project phases (1 – 4) under piped water supplied by surface water resources that is treated.

Flora and Fauna

Fauna: The Omusati Region is a land of striking biodiversity, characterized by its unique blend of ecosystems, ranging from arid savannahs to seasonal wetlands. This diversity has nurtured a rich variety of mammals and reptiles, each uniquely adapted to the region's semi-arid climate.
Fauna species found in the area consists of the following: wildlife – mammals and reptiles; bird species and snakes
Flora: The Omusati Region in Namibia is characterized by a semi-arid to arid environment, which significantly influences its vegetation. The Project Area predominantly falls within the Acacia Tree and Shrub Savanna Biome. South and southeast of Ruacana, located in the Ferralic Arenosols soils, broad-leafed woodlands of the Western Kalahari are dominant featuring Mopane savannah (Colophospermum mopane) with annual grasses on poor quality soils stretching over extensive flat plains of the Omusati Region. The vegetation changes from a community of open, short shrubs dominated by acacia species and Mopane in the south, to heterogonous savannah of taller Mopane in the far north. Grasslands occur on the heavier saline soils in the northeast. The *iishana* are often lined with trees and bushes. In the west and around Opuwo, below the escarpment, underlain by various soil types associated with rocky areas and calcrete, grasslands and scattered trees are the dominant structure of the Western Highlands vegetation type.

Socio-economic characteristics

Poverty: In 2021, Omusati Region had a headcount multidimensional poverty rate of 50.7%. Although Omusati region is not among the highest regions (Kavango East and West) with multidimensional poverty rates, However, in terms of the population counts, the regions with the highest number of poor people are Ohangwena, Khomas and Omusati, thus providing potable water in the region improve the economic and social welfare of the people in the region. This is because potable water would allow people to address health issues from drinking unsafe water, minimise time spend on collecting water and direct that to other economic activities especially for women. Also, there are other direct economic benefits comes with provision of portable water in the region that will address the high poverty ration per head in the region.

Household Consumption: The Kunene and Omusati Regions show very similar annual rates of per capita consumption in 2015/16 (~N$14,000/capita), which are approximately half the national average (~N$28,000/capita), indicating that these two regions are among the poorest in the country – only the Kavango Regions (East and West) and the Zambezi Region are poorer.

Income: The major source of income in Omusati region is subsistence farming (39%) followed by salaries and wages (25%) and pensions (18%).

Water Supply in the Project Area

The portion of the Omusati Region's population with access to safe water (86%) almost exactly matches that of the average access in rural areas across the country (85%), perhaps mirroring the majority rural demographic of this region. The Kunene, Omusati, Ohangwena, Kavango East and West and Zambezi Regions are the only regions with less than 90% of their populations having access to safe water.

Archaeology and Cultural Heritage

A low archaeological impact was observed in the project area. Only sites of cultural and social significance identified were formal and informal graves, cemeteries and burial grounds, these sites are subject to a buffer zone of at least a 20m radius (in situ protection and management).

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Namibia Policy, Legal and Administrative Framework

The ESIA was prepared with reference to key legal national instruments including the Constitution of the Republic of Namibia, the Environmental Assessment Policy (1995) and the Namibia's Environmental Management Act of 2007 and the EIA Regulations of 2012. All these pieces of legislation collectively promote sustainable social and economic development through the sound management of the environment and natural resources. Both the Environmental Assessment Policy (1995) and the Namibia's Environmental Management Act of 2007 recognize the trade-offs between economic development and environmental degradation and calls for the use of EIA and environmental monitoring as tools for minimizing impact of development on environment. The upgrade of water infrastructure project in Omusati will integrate the principles of the environmental policy into the project so that work is done in an environmentally responsible manner. Other policies and guidelines of relevance to the project include Water Resources Management Act 2004, the Forest Act 12 of 2001, the 5th National Development Plan (NDP5), all of which provide sectoral frameworks for the mainstreaming of thematic areas into the development process.

Other Applicable Namibian Legislation

Other Namibian legislation of direct relevance to the Project are summarized in Table 1 below. Also given in this table are the Project specific implications of each relevant piece of legislation.

Table 1: List of Legislation Applicable to the Project.

Statute	Provisions	Project Implications
Forest Act 12 of 2001	Provision for the protection of natural vegetation. No regulations promulgated yet. Section 22(1): It is unlawful for any person to "cut, destroy or remove: i. Any living tree, bush or shrub growing within 100 meters from a river, stream or watercourse on land that is not part of a surveyed erf or a local authority area without a sense. ii. Vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilizing the sand or gully.	Permits should be obtained from Department of Forestry for the removal of protected trees.

Atmospheric Pollution Prevention Ordinance 45 of 1965	Part IV - dust control, and Part V - air pollution by fumes emitted by vehicles	Application for an Air Emissions permit from the Ministry of Health and Social Services (if required).
National Heritage Act 27 of 2004	Heritage resources to be conserved in development.	All archaeological sites to be identified and protected.
Soil Conservation Act 76 of 1969	Prevention and combating of soil erosion; conservation, improvement and manner of use of soil and vegetation, and protection of water sources. The Minister may direct owners or land occupiers in respect of inter alia water courses. No Regulations exist to this effect.	Removals of vegetation cover to be avoided and minimized at all costs. Soil pollution to be avoided.
Water Management Act 24 of 2004	Section 32 states that no person may abstract or use water, except in accordance with a license issued under this Act. Abstraction of water including open waters, aquifer, brackish or marine water. Section 46 states that any drilling to be conducted or enlargement of an existing borehole can only be conducted under a permit issued under the Act. Section 56 states that a person may not discharge any effluent directly or indirectly to any water.	Obligation not to pollute surface water bodies. The following permits are required in terms of the Water Act: Water abstraction permits that will form part of the contract obligations.
Public Health Act 36 of 1919	Provides for the prevention of pollution of public water supplies.	A general obligation for the Contractor not to pollute the water bodies in the area.
Hazardous Substances Ordinance 14 of 1974	Control of substances which may cause injury or ill-health or death of human beings because of their toxic, corrosive, irritant, strongly sensitizing or flammable nature, and for the control of certain electronic products and radioactive material. Does not regulate the transport or dumping of hazardous substances. Regulations only relate to the declaration of certain substances as hazardous substances.	The handling and storage of hazardous substances on the Project Site should be carefully controlled. Disposal of hazardous substances needs to be carefully controlled.
Preservation of Trees and Forests Ordinance	Protection to tree species.	The Contractor will require a permit to remove any protected trees.
Nature Conservation Ordinance 4 of 1975	Requires a permit for picking (the definition of "picking" includes damage or destroy) protected plants without a permit.	In case there is an intention to remove protected species, then permits will be required.

African Development Bank

The project shall be implemented in compliance with the Bank's Environmental and Social Assessment Procedures. The design, implementation and monitoring and evaluation modalities for the project have been informed by the Bank's environmental and social policies and guidelines. Considerations are premised on expectations for assessing and addressing environmental and social impacts in line with the Bank's Integrated Safeguards System (ISS) (2013): Based on the projects scoping report, all the five Operational Safeguards (OS) embedded in the ISS were considered and only four were triggered, and these are;

- *Operational Safeguard* 1: Environmental and social assessment, which is the overarching Operational Safeguard that mainstreams environmental and social considerations in all Bank operations
- *Operational Safeguard* 3: Biodiversity, renewable resources and ecosystem services which reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of natural resources.
- *Operational Safeguard 4*: Pollution prevention and control, hazardous materials and resource efficiency, which is intended to achieve to achieve high quality environmental performance, efficient and sustainable use of natural resources, over the life of a project
- Operational Safeguard 5: Labour conditions, health and safety that basically protects workers right.

Operational Safeguard 2 which provides for involuntary resettlement land acquisition, population displacement and compensation was considered but not triggered because the project does not have direct displacement of individuals and/or communities.

Other Bank policies that were closely examined include; Climate Action Plan, Policy on Poverty Reduction, the Policy on the Environment, the Gender Policy, the Policy on Disclosure and Access to Information and the Cooperation with Civil Society Organizations – Policy and Guidelines.

International Conventions and Protocols

Below are some of the key multilateral environmental agreements that are most relevant for the project and were taken into account during the Environmental and Social Assessment;

The Stockholm Declaration on the Human Environment, Stockholm 1972

The declaration refers to the fact that natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate. The declaration also states that countries have a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat, which are now gravely imperilled by a combination of adverse factors. Nature conservation, including wildlife, must therefore receive importance in planning for economic development. The other component being that states shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Convention on Biological Diversity, Rio de Janeiro, 1992

Namibia is accordingly now obliged under international law to ensure that its domestic legislation conforms to the CBD's objectives and obligations which requires ESIA's for projects that are likely to adversely affect biological diversity. It further requires that the EIA be aimed at avoiding or minimising such effects and where appropriate, allow for public participation in the assessment.

POTENTIAL IMPACTS DURING DIFFERENT PROJECT PHASES

Potential impacts (positive and negative) were identified, and their significance were established. Inputs from stakeholder consultation and field assessments augmented by literature review were used to identify the project impacts.

List of identified Impacts

Impact Category	Project Phase	Impact List
Positive	Construction	• Employment creation and income generation • Skills transfer • Empowerment of local businesses • Economic boost of the local economy
	Operation Phase	• Economic benefits from improved safe, easily accessible clean water • Health benefits from improved potable water access • Gender equality benefits • Water Infrastructure development and betterment of the communities • Climate change adaptation • Employment creation and income generation
Negative (adverse)	Construction	• Physical disturbance of the soil • Biodiversity loss: domestic and wild fauna as well as flora • Impact on Land Use Change (Aesthetic value) • Impacts on surface and groundwater resources (abstraction, and pollution) • Waste generation • Culture, heritage and archaeological impacts • Occupational and community health and safety risks/hazards. • Displacement of properties • Air quality (emissions of GHG) • Noise generation • Dust generation • Vehicular traffic safety • Impact on local road use • Increases the climate risk. • Community conflicts
	Operational phase	• Occupational and community health and safety risks/hazards. • Water access and operations conflicts among commmunities

	Decommissioning Phase	• Soil disturbance • Disturbance to traffic • Air pollution • Noise pollution • Waste generation • Occupational health and safety

Impact significance assessment

The identified impacts were assessed to establish their significance. The significance of impacts was determined by calculating five characteristics of impact description. The significance of the impact "without mitigation" was the main determinant of the nature and degree of mitigation required. Table 2 shows the impact significance of several social and biophysical components.

Table 2: Results of impact significance assessment.

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Vegetation Clearing	√	√	√	√	√	√	√		√		√	√	√	√	C O	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Air pollution	√	√	√	√			√	√	√				√	√	C O	Short	Moderate	Local	Direct	Medium 25 - 75%	Minor (-)
Soil pollution	√	√	√	√	√	√	√		√	√	√			√	C O	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Soil erosion	√	√	√	√	√	√	√		√	√	√			√	C O	Short	Small	Local	Direct	Medium 25 - 75%	Major (-)
Water resources pollution	√	√	√	√				√		√	√		√	√	C O	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Major (-)
Water resources depletion	√	√	√	√	√			√		√	√			√	O	Permanent	Moderate	International	Direct	High >75%	Major (-)
Solid waste Generation	√	√	√	√		√	√	√	√	√	√		√	√	C O	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Major (-)
Vehicular Movements	√			√	√		√	√	√				√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Hazardous Substances storage and handling	√	√			√		√						√		C O	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Major (+)
Excavation of pipeline trenches	√	√	√	√	√	√	√		√	√			√	√	C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Construction camps establishment	√	√	√	√	√	√	√		√	√			√	√	C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Vehicular traffic	√			√	√		√			√			√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Water Supply		√	√	√				√		√	√		√	√	O	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Social Aspects Proliferation						√		√	√	√	√	√	√	√	C	Short	Small	Local	Direct	Low <25%	Beneficial Minor (+)
Boost in water reliant activities	√	√	√	√	√	√		√		√	√		√	√	O	Permanent	High	Regional	Direct	High >75%	Beneficial Minor (+)
Employment Creation	√			√	√			√		√	√		√	√	C O	Permanent	High	Regional	Direct	High >75%	Beneficial Major (+)

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Livelihoods Development				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Climate Resilience	√	√	√	√				√			√				O	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Inclusion of Women and Children	√	√	√								√		√	√	CO	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Sanitation and Health Improved		√	√							√	√		√		O	Permanent	High	Regional	Direct	High >75%	Beneficial Major (+)
Skills transfer				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Economic benefits from improved safe, easily accessible clean water				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Developed Water administrative system		√	√								√		√		O	Permanent	High	Regional	Direct	High >75%	Beneficial Minor (+)
Land Use change	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)
Occupational Hazards													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Pressure on local services and Resources	√		√	√	√			√	√	√	√			√	CO	Short	Medium	Local	Indirect	Medium 25 - 75%	Minor (-)
Noise	√	√	√	√	√	√	√		√	√	√			√	C	Short	Small	Local	Direct	Medium 25 - 75%	Major (-)
Air quality issues (dust)	√	√	√	√	√	√	√		√	√	√			√	C	Short	Small	Local	Direct	Medium 25 - 75%	Major (-)
Community health and safety													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Impacts on water supply	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)
Labour													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Water Supply requirements	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Sexual Exploitation, Abuse and Harassment (SEAH)	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)

STAKEHOLDER/COMMUNITY CONSULTATIONS

Stakeholder/community engagement and consultations was thoroughly conducted and guided by both the national regulations/requirements and the bank operational safeguard standards. Several activities were conducted to ensure that all the stakeholder concerns, feedback and comments are taken into consideration to improve the environmental and social management of the project.

Stakeholder identification: this was the initial step. It involved identifying through various approaches the interested and affected communities and parties.

Communication with stakeholders/communities: A mix of approaches were used to communicate with I&APs. This consisted of newspaper adverts, in-person delivery of project material and notices, local radio announcements, site notices and word of mouth with various stakeholders.

The following activities were undertaken during communication and engagement with stakeholder:

- Building a Stakeholder Database: A stakeholder database for the project was compiled with pre-identified key stakeholders throughout the ESIA Study. During the advertisement of the project (though public notices in local newspapers), the list was augmented as I&APs registered, and contact information of stakeholders updated.
- Circulation of the Background Information Document (BID) which contained brief descriptive of project information on proposed activities circulated with identified and registered I&APs.
- Placement of newspaper adverts (ESIA Study public notifications) in two different newspapers. The adverts were placed in the *New Era* and *Windhoek Observer* newspapers dated 30 June 2023 and 07 July 2023 respectively. The project details were briefly explained in the newspapers and inviting members of the public to register as I&APs.
- Radio announcements for the ESIA Study's consultation meetings were made to the communities via the Omusati Regional Council's local constituency offices (Ruacana South and Onesi, Constituencies). The letter of notification and consultation schedule was shared with the Office of the Chief Regional Officer for the Omusati Regional Council on the 29th of June 2023.
- Site notices were placed throughout the study area in strategic positions where it can reach as many local communities as possible.
- Consultation meetings: consultation meetings were held with stakeholders, local leadership and communities in Omusati Region. These took place between 18 and 30 July 2023. A total of 265 people were consulted in different communities. Given how potable water issues are gender sensitive especially in the provision of rural potable water, a gender responsive stakeholder consultation was carried out. Issues from women who are mostly responsible for water collection and management at domestic level were prioritised and the identified project impacts and corrective measures took into consideration these issues.

Key issues from stakeholder consultation: several and critical social, environmental, economic and other relevant issues were raised during community meetings. These are summarised below:

Table 3: key issues noted throughout the consultation period (consultation meetings).

Category	Specific key issues raised
Land Use	- Clarification on whether there is going to be displacement and how in case of compensation of properties affected by water infrastructure, how is it going to be negotiated. - Interested in the exact pipeline routes. Interested in plans of the project preliminary designs.

Economic	- Employment of local people during project implementation mostly the youths and women. - If women are going to equally considered for the available employment opportunities? - How the recruitment and management and handling of labour associated with the project going to take place. - Express the urgent need for clean (good water quality) and accessible water supply in the communities. - Raised challenges of affordability of water and non-payment of accounts for water during operational phase.
Environmental	- Protected tree species were mentioned to be important, and compensation should be ensured. - Consideration of water for livestock by the project, (project should not be limited to human consumption only). - Water infrastructures should minimise passing through conservancies to minimize human-wildlife conflicts. - Protection of heritage and cultural sites and minimum disturbance of these areas.
Social	- Issue of water affordability (although access improves, communities are concerned on if water costs accrue, it should be afforded so that the marginalised and less privileged in communities can still access it without suffering social exclusion to water). - How are the issues of varying water pressure in other communities going to be addressed? - Emphasised stakeholder disclosure and continued engagement throughout the project planning and implementation. - Want to know if the graves are going to be relocated if pipelines interfere with cemetery areas. - The project times - urgency of the project as they have heard about the project since 1990s and with impacts caused to lack of access to clean water continues to grow each time the project delays. (Important to manage community expectations to avoid tension) - Concerned about groundwater (borehole water) quality issues (poor water quality (salty)), making the water unfit for human consumption. - Protection of cultural and spiritual sites such as graveyards, areas of worship (archaeology). - How vandalism of water infrastructures such as meters by some community members is going to be addressed. Suggest that the Installation of water meters should be close to the community/people for protection. - Project should avoid the exclusion to access water of some community members because of the social status or because of gender.
Technical/ Operation of the pipeline	- Discussion about the need for training to read water meters and the existence of different types of meters. - Concerns about to what extend the project will provide water especially from communities that do not have connection at present. - Lack of training of the communities on how to take meter readings. They are charged high because they are giving wrong figures to NamWater thus they end up not accessing the water due to higher bills that leads to water cut offs.
Payment of water	- Concerned about the existing system of community payment for the operation and maintenance of water infrastructure support such as generators.

MITIGATION/ENHANCEMENT MEASURES

The ESMP incorporated all the issues raised by communities and key stakeholders to address the environmental and social impacts associated with project development. Comments and feedback from the stakeholders were vital for informing some of the corrective and management measures suggested in this ESMP.

INSTITUTIONAL ARRANGEMENTS AND CAPACITY BUILDING REQUIREMENTS

ESMP Implementation Roles and Responsibilities

As the Proponent, MAWLR is ultimately responsible for the implementation of the ESMP, but they may delegate this responsibility or part of it to someone else at any time, as they deem necessary. The transfer of responsibility should be clearly communicated and recorded. MEFT as the regulator (through the EC) is responsible for implementation of the Environmental Management Act, and MAWLR as the project Proponent are entirely responsible for the implementation of the project's ESMPs. The EC advises organs of state on the preparation of environmental plans, receives and records applications for ECCs and the overall management, protection, reviewing of the assessment report and enforcement of monitoring and implementation of environmental plans in accordance with the EMA.

To manage the ESMP implementation, copies of the approved ESMP shall be given to all relevant departments, kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarize themselves with the contents of this document.

Table 4: The roles and responsibility for implementing the ESMP.

Role	Responsibilities
MAWLR: **The Implementing Agency and Project Proponent**	MAWLR, as the implementing agency, will be responsible for: - Managing the implementation of this ESMP and updating and maintaining it when necessary. - Ensuring that the environment is rehabilitated to its natural state as far as possible. MAWLR shall ensure that all employees attend an Environmental, Awareness Training Course to increase compliance and reduce the environmental impact of the project activities. - The training course shall be structured to ensure that trainees/employees are capacitated with appropriate knowledge to: i. Become familiar with the environmental, health, and safety controls contained in the ESMP. ii. Be aware of the importance to conserve water and minimise waste to ensure sustainable development. iii. Be aware of MAWLR's Code of Conduct. iv. Be aware that a copy of the ESMP is readily available as a reference at the site office and that all staff are aware of the location and have access to the document. v. Ensuring that there are employee information posters outlining the environmental "do's" and "don'ts" (as per the environmental awareness training course) will be placed at prominent locations throughout the site.
Proponent's Project Manager	- Ensuring that the objectives of this ESMP are achieved at the various project lifecycle phases. - Work together with ECO to ensure that this ESMP is implemented and that penalties and fines for non-compliances are enforced onsite. - Ensuring that all identified environmental impacts are managed according to the environmental principles of avoiding, minimizing, mitigating and rehabilitation. This will be achieved by the successful implementation of the ESMP. - Managing and monitoring of individuals and/ or equipment on-site in terms of compliance with this ESMP and issuing fines for contravening ESMP provisions. - Ensuring that appropriate environmental monitoring and compliance auditing is done and that biannual reports are submitted to the MEFT.
Contractor (Site / Construction Manager): **To be appointed by MAWLR.**	- The Contractor and / or its agents will be responsible for environmental management on site during the construction phases of the project. For the purpose of this document: "the Contractor" (and its sub-contractors) refers to construction personnel responsible for construction activities planned for this project. - The Contractor will appoint an Environmental Site Officer (ESO) who will be responsible for ensuring that the ESMP requirements are implemented on-site on behalf of the Contractor. - The contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the ESMP. Failure by any employee of the Contractor, Sub-contractor, and Suppliers etc. to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ESO to instruct the EM to have the employee removed from the site.

Role	Responsibilities
	- A pre-construction meeting is recommended to reach agreement on specific roles of the various parties and penalties for non-compliances with the ESMP. In addition, surrounding residents, landowners or occupiers of land must be notified in advance of any potentially disturbing activities.
Environmental Site Officer (ESO): **To be appointed (as part of the Construction Contractor Team)**	The ESO is expected to administer and control all environmental matters during the construction phase. The ESO will be responsible for the following among others: i. Identify non-compliance and recommend corrective measures in consultation with MAWLR's Project Manager, the EM and the ECO as required. ii. Ensure that environmental problems are remedied timeously and to the satisfaction of the Project Manager, and the ECO as required; iii. Set up activity-based method statements prior to the start of relevant construction activities and submit these to the Project Manager, the EM and the ECO as required; iv. Perform ongoing environmental awareness training of the Contractor's site personnel as and when required. v. Ensure implementation of the ESMP. vi. Ensure safe keeping and easy accessibility of correct environmental records at all times. vii. Ensure accurate and timely communication of ESMP requirements to relevant project, contractor and sub-contractor personnel as required for ESMP implementation. viii. Monitor compliance of ESMP implementation and compliance of all contractors and sub-contractors onsite. ix. Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the ESMP. This includes identifying additional project training requirements and implementing the training programme. x. Update and maintain training records for all project personnel including contractors. xi. Maintain environmental incidents and stakeholder complaints register. xii. Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the ESMP implementation is at an optimal level. xiii. Report significant incidents internally and externally as required by law and the conditions of authorization. xiv. Investigate incidents and recommend corrective and preventative actions. xv. Provide support and advice to the contractor and all sub-contractors in the implementation of environmental management procedures and corrective actions. xvi. Ensure that monitoring programs, which assess the performance of the ESMP, are implemented. xvii. Ensure maintenance of site document control requirements. xviii. Assess the efficacy of the ESMP and identify possible areas of improvement or amendment required within the ESMP.
Environmental Control Officer (ECO): **D&P Environmental Consultants**	The ECO for the site is an independent environmental consultant to monitor and review the on-site environmental management and implementation of this ESMP on the construction site. The duties of the ECO are to: - Ensure that all construction or decommissioning activities on site are undertaken in accordance with the ESMP. - Conduct environmental compliance audits and reporting as required by law. - Provide support and environmental advice to the project team, contractors, and all subcontractors in the implementation of environmental management procedures and corrective actions. - Report significant incidents internally and externally as required by law and the ECC conditions. - Ensure that ESMP performance monitoring programs are implemented. - Assist in incidents and non-conformances investigations and implementation of effective corrective and preventive measures. - Assess ESMP effectiveness and identify possible areas of improvement. - Facilitate the amendment of the ESMP in liaison with the Environmental Manager. - Provide environmental training for key project personnel (in liaison with Environmental Manager). i. Conducting site inspections of all areas with respect to the implementation of this ESMP (monitor and audit the implementation of the ESMP). ii. Advising the Proponent or Site Manager on the removal of person(s) and/or equipment not complying with the provisions of this ESMP. iii. Making recommendations to the Proponent with respect to the issuing of fines for contraventions of the ESMP.

Role	Responsibilities
	iv. Undertaking an annual review of the ESMP and recommending additions and/or changes to this document.
Public Relations Officer (PRO): **To be appointed by MAWLR or form part of the Construction Contractor Team**	The key primary responsibility of PRO is implementation of Grievance Regress Mechanism (GRM). PRO will be specifically responsible for the following: - Liaising between the stakeholders, public (communities) and the Proponent. - Ensure effective communication with stakeholders, media (if necessary) and the public. - Organising and overseeing public relations activities, Managing public relations issues. - Preparing and submitting public relations reports, if required. - Collaborating with personnel and maintaining project-related open communication among personnel.

Corrective, Mitigation and Management Measures

Since the project's negative impacts to the receiving environment are experienced in all phases of project development, the management, mitigation and corrective measures also follows same structure to ensure that impacts are well managed for all the four phases (planning & design, construction and post-construction), operations & maintenance and decommissioning).

Table 5: Enhancement/Mitigation Measures for bio-physical environment

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
Planning and Design Phase			
Ineffective communication of the project's GRM that limits transparency and participation of affected parties.	To sensitise the communities about the GRM for affected persons to be able to openly share their concerns or issues regarding project activities at different project development phases	i. Establish GRM and clarify roles and responsibilities (see GRM section of ESMP) ii. Provide contractor with GRM contact details to be used for: a. GRM sign boards; b. GRM Contact Cards for Affected People iii. Erect sign boards at the construction site entrance with: a. Project details. b. GRM procedures and contact details. iv. Print 'GRM Contact Cards' for all workers to give to complainants and keep cards with all vehicles, machinery and site managers/foremen. v. Affected People Training. Contractor to raise awareness of all workers on how to respond when an affected person or member of the public has a complaint i.e., direct the person to the most senior site manager present	Implementing Agency / Contractors / Supervising Consultant
Construction Phase			
Health and social pathology.	To prepare the receiving communities where outsiders project people will be received to carry out project activities.	i. Prior to commencing construction, the risk of an increase in the spread of HIV/AIDS should be explained to regional health authorities and partners be identified amongst all stakeholders to formulate a joint programme to limit the spread of HIV during the construction period. ii. Particular provisions shall be worked into the tender documents for the contractor to approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS education programmes periodically on site.	Contractors/ Implementing Agency. Partnership with National and Regional HIV task forces and NGO's working in the field.
Conflicts	To reduce conflicts between workers in the camp sites and between workers and the receiving communities.	i. A meeting should be arranged with the local community once the contractor has been appointed. ii. The contractor shall appoint an ESO from the construction team to take responsibility for the implementation of all provisions of this ESMP. iii. One meeting for site-handover and to introduce the local community and farmers to the Contractor. iv. A system for the on-going management of the communication between the Contractor and local communities, which should include; a means for lodging a complaint concerning construction activity, provision of feedback to the plaintiff from the Contractor stating how the issue is being addressed, report back on issues raised and how addressed from the Contractor to the Project	Contractors

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		Manager and Proponent, and detailed construction programme should be presented during a meeting with the local communities and stakeholders.	
Vegetation loss	To prevent indiscriminate loss of vegetation due to project activities.	i. The routes for the planned facilities such as pump stations, reservoirs, pipeline routes should be located at the early stages of the project (before construction) and ensure that they are placed where there are no trees or minimum number of trees. ii. Make use of existing linear infrastructure such as roads to lay the pipelines alongside and make use of existing access roads. iii. Position new pipelines in such a way to follow existing access roads in the project area. iv. Avoid unique and special habitats or culturally protected areas. v. Create buffers from special, sensitive and ecologically important habitats.	Planning & Design Engineer Contractor
Wildlife poaching	To prevent the poaching of wildlife by the construction workers thus protecting the biodiversity in the project area.	i. Commit to creating awareness among the project workers and the impact of such crimes on the host environment and country at large. ii. Report any suspicious activities related to wildlife crime to the nearest Police. iii. To minimize the risk of poaching by outsiders, commit to hiring more locals for jobs that they can do, as they are likely to appreciate the importance of conserving wildlife in their areas. iv. Incorporate a No-tolerance rule for poaching in every employment contract and ensure that the workers understand the seriousness of this. In other words, there is no tolerance for poaching or to wildlife crime.	Contractor ESO
Soil erosion and compaction	To reduce soil erosion and other associated land degradation from the excavations for pipeline installation and other infrastructure such as boost pump house and storage tanks.	i. Stockpiled topsoil and materials should be used to backfill the excavated and disturbed site areas such as borrow pits. ii. Topsoil stripped from certain site areas to enable project works and can be returned to its initial position, should be returned. This is to avoid unnecessary stockpiling of site soils which would leave them prone to erosion. iii. Vehicles/machinery should stick to access roads provided and not to unnecessarily create further tracks on and around the site by driving everywhere resulting in soil compaction and erosion. iv. Unnecessary off-road onsite and neighbouring areas is strictly prohibited. Stick to approved site access roads.	Contractor.
Soil pollution	To minimise soil pollution from cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material, fuel leaks, heavy vehicles/ movement of vehicles across site.	i. Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils. ii. In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste. iii. If fuel is stored at the construction camp, fuel tanks must be properly bunded. The volume of the bunded area must be sufficient to hold twice the capacity of	Contractor ESO

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		the storage tanks. The floor of the bunded area must be impermeable and the sides high enough to achieve the twice holding capacity. iv. Drip trays should be available for all equipment that is intended to be used during construction. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned every morning and the spillage handled as hazardous waste. v. Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose. vi. All cleaning of equipment should take place within the construction site and the water from washing operation should be collected in a tank and disposed of in agreed manner. vii. The movement of vehicles to and across the site should be controlled. Construction material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil. viii. For the safety of the homestead residents and immediate community members who utilize the existing access path, the contractors should create safer routes to be used by the road construction vehicles only and avoid the existing community paths.	
Loss of biodiversity - (fauna and flora)	To prevent loss of biodiversity from illegal hunting of wildlife in the project area, uncontrolled or unauthorized removal trees, especially protected tree species may lead to that species in the area	i. Refrain from disturbing or killing wildlife found on and around the project sites. ii. Breeding sites for animals and birds occurring on and around the project pipeline route should not be destroyed nor disturbed. iii. Pipeline trenches should be secured (temporary fencing/ covering) and backfilled and capped after sampling is completed to prevent animals from falling into trenches. iv. Incorporate Environmental awareness and biodiversity preservation into the employment contracts of all workers. v. Avoid unnecessary removal of vegetation to promote a balance between biodiversity and the project. vi. Vegetation found on the site, but within the footprint of the infrastructure route or access route should be left undisturbed/avoided. vii. Barricading tape (to indicate working areas) should be established. viii. Vehicle movement should be restricted to existing roads and tracks to prevent unnecessary damage to the surrounding vegetation. ix. No onsite vegetation should be cut or used for firewood. x. Access roads should be created in a manner that disturbs minimal vegetation.	Contractor ESO

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		xi. Environmental awareness on faunal and floral biodiversity preservation should be provided to the workers and contractors. This should be incorporated into the workers' contracts. xii. - Clearing of protected tree species should obtain permit first, tress should be replanted somewhere in the areas. Implement a re-vegetation plan after project construction activities.	
Dust Generation	To prevent dust generation in the construction area and communities through movement of heavy vehicles and earthworks mostly excavation for the pipelines and water infrastructure installation.	i. Vehicles should not be driven at a speed more than 40 km/h to avoid dust generation in the project area mostly in gravel roads. ii. At dust sources onsite, a reasonable amount of water should be used by using regular water sprays to suppress the dust that may be emanating from such sites. iii. Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers on site excavation-based areas, where they are exposed to dust as well as heavy machinery operators. iv. Machines, and vehicles should be regularly maintained to ensure efficiency and reduce dust generation and harmful gaseous emissions.	
Generation of Waste	To prevent waste generation from incorrect or infrequent disposal of building rubble, construction waste blown by wind (e.g., cement bags), domestic waste from campsites.	i. Construction waste should be stored in skips and should regularly be removed off the site for disposal at an applicable municipal waste disposal site. ii. Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste. iii. Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. iv. The various waste types shall be disposed of at appropriate municipal and recycling facilities. v. Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. vi. Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility. vii. The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the construction site and not at the campsite. viii. Sufficient waste bins should be supplied. ix. No waste should be burned nor buried onsite. x. Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week.	Contractor ESO
Noise generation.	To reduce or minimise noise from vehicles and construction activities.	i. Inform communities the schedules for operation of heavy noise machinery. ii. All machinery should be calibrated and maintained regularly.	Contractor ESO

Component/Issue	Objective	Management Measures	Responsibility/ Partnerships
		iii. No construction activities should be done during night-time hours, i.e., between 18h00 to 07h00 and over weekends. iv. Construction hours should be restricted to between 07h30 and 17h00 to avoid noise generated by construction equipment and the movement of vehicles before or after hours	
Community health and safety	To avoid or minimise lack of safety and health measures in the community during construction may lead to minor and serious injuries	i. Heavy vehicle, equipment and fuel storage site should be properly secured, fenced off and away from public exposure and access. ii. Trenches should be temporarily fenced off during sampling, and once completed, they should be backfilled thereafter. iii. An emergency preparedness plan should be compiled, and all personnel appropriately trained. iv. Ensure that goods and projected loads are securely fastened to vehicles to avoid falling and injure people or animal along the project route. v. Warning signage should be erected at hazardous site areas such as open trenches. The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs clearly written in English and local languages (Oshiwambo).	Contractor ESO

Institutional Capacities and Strengthening Plan.

The Implementing Agency for the Project is the Directorate of Water Supply & Sanitation Coordination in Ministry of Agriculture, Water and Land Reform (MAWLR). Whereas the Ministry of Agriculture, Water and Land Reform is institutionally experienced to manage the implementation of major infrastructure projects, it lacks sufficient technical capacity in the Directorate of Water Supply & Sanitation Coordination to allow a dedicated and specialised environmental and social management function. The monitoring functions shall be practiced by an independent consultant and addressed through the project management structures such as technical committees, project steering committee and site meetings. In addition the permit conditions of the environmental clearance will be monitored by the relevant Ministry of Environment, Forestry and Tourism staff. In general terms the institutional capacity to effectively manage social and environmental matters is required through outsourcing from the consultant.

Monitoring Program

It is planned that the environmental and social impacts and their designed mitigation measures shall be monitored during implementation and operation phases of the project. The roles and responsibilities for monitoring the environmental and social impacts and mitigation measures in Table 4.

The monitoring of environmental and social impacts for the project will be guided by the development of a comprehensive planning, construction and operational phases of the ESMP. Responsibilities under the ESMP are currently envisaged to be allocated between MAWLR, its contractors and certain units with the Ministry of Environment and Tourism. MAWLR intends to augment its capacity through use of consultancy services in order to meet the environmental and social obligations that will be required of it for the purposes of this project. Monitoring activities which will consist of baseline monitoring, site inspections, monthly reporting and internal audits. The monitoring program is further elaborated in the Table 6.

Table 6: The summary of the monitoring program.

Issue	Parameter	Location	Frequency	Implementation	Supervision
Waste management	Evidence of waste collection and disposal. Provisions of bins in camp sites.	Construction corridor Contractors camp	Immediate	Contractor	Supervision consultant
Dust generation	Visual assessment during the works – daily inspection, Apply receptor sensitivity approach in proximity to sensitive receptors and general continual monitoring of excessive dust deposition and/or airborne occurrence, when and where construction active and especially under windy conditions and/or near to residential areas	Construction sites	Daily	Contractor	Supervision consultant/ MAWLR
Noise levels	Noise levels on dB; PPE Provided to workers. Communication with local communities. Inspection through rough assessment by answering the question: "Do you have to raise your voice to talk to someone respectively 1 m and 2 m away?"	Construction corridor Adjacent communities	As directed by the supervision consultant	Contractor	Supervision consultant
Soil and land resources	Monthly checking against mitigation measures specified in this EMP	Quarries, Borrow and Spoil Disposal Sites	Monthly	Contractor	Supervision consultant/ MAWLR
Oil spills/ soil contamination	Oil spill marks	Construction corridor Equipment yard (construction) Refuelling points within stations and workshops	As directed by the supervision consultant	Contractor	Supervision consultant/ MET/ MAWLR
Accidents	Safety training of the workers, accident log sheet/book/ reports, community consultations	Construction corridor	Monthly	Contractor	Supervision consultant
Health	Signs, posters displayed, first aid kits, HIV/AIDS Awareness campaigns, health checks for workers	Social impact assessment reports	Monthly	Contractor	Contractor/ Supervision consultant
Benefits to local communities	Employment wage levels Equity in water access	Reports on survey on local economy.		Contractor/ Supervision consultant	MAWLR/ Supervision consultant/ Other GRN Departments
Chance finds of Physical Cultural Resources	Awareness about and efforts to follow Physical Cultural Resources				

Monitoring will include: Visual observations; Selection of environmental parameters at specific locations; Sampling and regular testing of these parameters.

6.5. Costs for Environmental Management and Monitoring

Costs of certain items associated with environmental management and monitoring will be an integral part of specific items incorporated in overall project budgets, and no separate budget is necessary to cover these aspects. Such items comprise;

- Marginal costs of the contractor to be incurred in complying with environmental protection clauses in the construction contract are incorporated in unit rates and bill items and will thus be included as construction costs. It should be noted that no significant increase in construction costs is expected in connection with requiring compliance with environmental protection clauses, since these merely require the contractor to behave in a responsible manner in relation to the environment, in accordance with good construction practice.

- Environmental monitoring carried out by the Supervising Engineer's staff including inputs by the Environmental Specialist recruited by the Consultant is an integral part of general supervision duties/responsibilities and will be covered by normal construction supervision cost estimates and contract.

Costs which will be incurred by the various departments of the GRN in connection with management duties such as supervision and monitoring of the project also covering the implementation of the ESMP are classified as administrative costs.

7. Conclusion

Evaluation of ESIA/ESMP, it is evident that the proposed project is associated with both positive and negative impacts during construction, operation and decommissioning phases of the project. The following recommendations are made to enhance the viability of the project:

- The proposed mitigation and enhancement measures (the ESMP) should be implemented in order to minimize and/ or avoid the identified adverse environmental and social impacts of the proposed project. The ESMP should be provided as part of the Contractor's contract.
- The EMP should also be implemented to track the effectiveness of mitigation measures and hence further improvement of the mitigation plan. Monitoring will be used as a means of ensuring compliance with national or international standards.
- MAWLR of Namibia will be required to embark on a monitoring program as part of the construction to ensure that the project is not in any way causing adverse environmental and social impacts.

1. BACKGROUND

1.1. Overview

Namibia is currently facing water insecurity and sanitation problems. To address the challenge, the Government of the Republic of Namibia (GRN) through the Ministry of Agriculture, Water and Land Reform (MAWLR) embarked on implementing the Namibia Water Sector Support Program (NWSSP). The NWSSP is supported by African Development Bank (AfDB). The program is aimed at increasing potable water access, improve quality and sustainability of water supply and sanitation services in Namibia to achieve the Sustainable Development Goal 6 (SDG6) targets of the United Nations and the development needs of the country listed in the National Development Plan 2017-2021, (NDP 5). The NWSSP has been designed to cover critical and urgent water supply and sanitation activities across Namibia.

Water insecurity continues to be a serious constraint in achieving the economic, environmental and social development agenda in Namibia. With highly variable and unpredictable rainy seasons in the country, the NWSSP priority is given to potable water and other immediate domestic purposes including livestock. The second priority is given to water for economic activities such as mining, industries and irrigation.

For successful and effective implementation of NWSSP, there is a need for National Administrators' will, commitment and on-going endorsement of the program. The program aligns with other development priorities in the country. This includes the country's Vision 2030 which aims to eradicate poverty, reduce unemployment, provide housing, **potable water**, **health services** and quality education and successive National Development Plans. The NWSSP; thus, helps to achieve the Vision 2030 goal by improving potable water supply and sanitation services components of the vision. The NDP5 also places health as top priority which promoted by NWSSP. Thus, the NDP5 pitches sanitation highly, with a desired outcome that by 2022, access to improved sanitation will increase from the current estimated status of 28% to 40% in rural areas and from 77% to 87% in urban areas.

Following the completion of the Strategic Environmental and Social Assessment (SESA) of the NWSSP in 2019, the current project (Ruacana South Water Supply Project – RSWSP) was among the program's activities that were recommended for an ESIA. The project activities are classified as Category 1 of AfDB's Operational Safeguards (OS) system which requires the completion of an ESIA and the implementation of an appropriate ESMP to mitigate the adverse impacts from the project. This, therefore, necessitated the current study. Sections and Chapters below explain in detail the project activities, expected impacts, how various stakeholders were involved for sustainable management of expectations and impacts of the project activities as well as detailed steps to manage and mitigate the adverse impacts from the project activities.

Consequently, the MAWLR (hereinafter referred to as the Proponent)'s Directorate of Water Supply & Sanitation Coordination (DWSSC) appointed D&P Engineers and Environmental Consultants as an independent player for the ESIA for upgrade the water supply network for RSWSP Phase 1 in the Omusati Region.

1.2. Project Location and Background

The RSWSP Project Area covers the Onesi, Ruacana and Tsandi Constituencies of the Omusati Region and the Opuwo Rural and Opuwo Urban Constituencies of the Kunene Region. A phased project development

approach is being following for the implementation of the project activities with Phases 1 – 4 that are divided into Sub-Areas 1 – 4 (see Figure 1). The Phase 1 Sub-Area 1 is located towards the northwest of Namibia, south of the area around Ruacana, which is close to where the Kunene River forms the border between Namibia and Angola to the north (see Figure 1). Being located along and across the border between the Kunene and Omusati Regions, the RSWSP lies to west of the Cuvelai Area, which in hydrological terms, being a transboundary wetland system, is termed the Cuvelai-Etosha Basin (CEB), or in Namibia, the Cuvelai Basin. The description of the RSWSP Sub-Areas is presented below (see Figure 1).

5. Sub-Area 1 – the portion between Olushandja and Ruacana;
6. Sub-Area 2 – the area south of the boundary of Sub-Area 1 up to Omakange, extending10 km either side of the tar road to Kamanjab (C35);
7. Sub-Area 3 – the western "arm" between Omakange and Opuwo, extending 10 km either side of the tar road to Opuwo (C41);
8. Sub-Area 4 – the eastern "arm" between Omakange and Okatseidhi, extending 10 km either side of the envisaged pipeline.

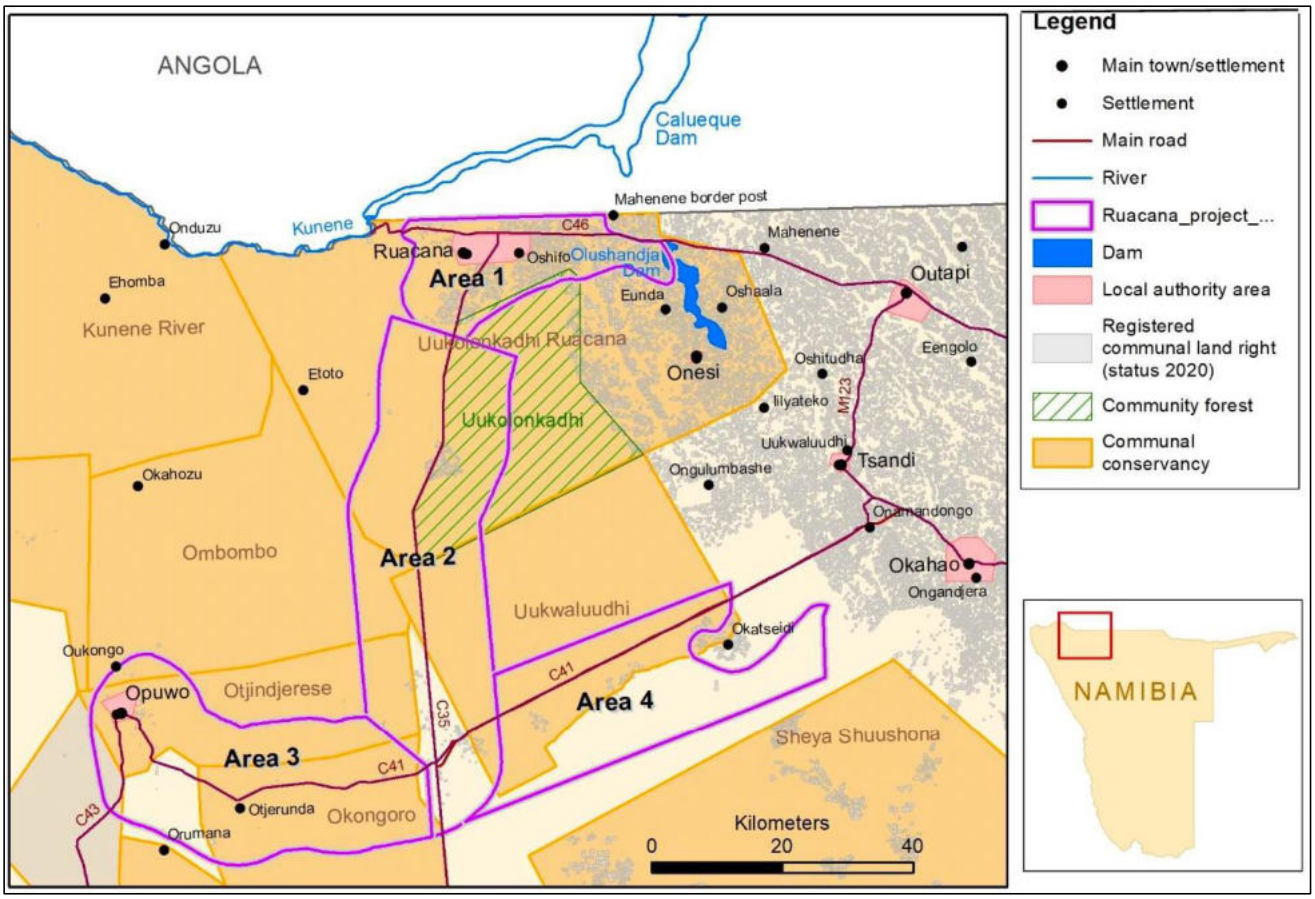

Figure 1: Location of RSWSP Sub-Areas 1 – 4 highlighting current Sub-Area A in relation to other Sub-Areas (2 – 4) and Phases 2 – 4 of the RSWSP.

For this assessment, only Phase 1 Sub-Area 1 of RSWSP was considered. The project pipeline route has an expansion area of approximately 520 km^2 from the Olushandja Purification Plant in the east to the Ruacana Falls (see Figure 2)[1].

In brief, the RSWSP Phase 1 project activities consist of the following (see Chapter 3 for detailed description of the project activities including specifications of the proposed water infrastructure):

i. Upgrade of the existing main and sub-mains including installation of booster pumps to increase pressure.
ii. Installation of new sub-mains pipelines extending to other new areas/ communities.
iii. Installation of other pipeline and other service infrastructure.
iv. Installation of reservoir infrastructures.

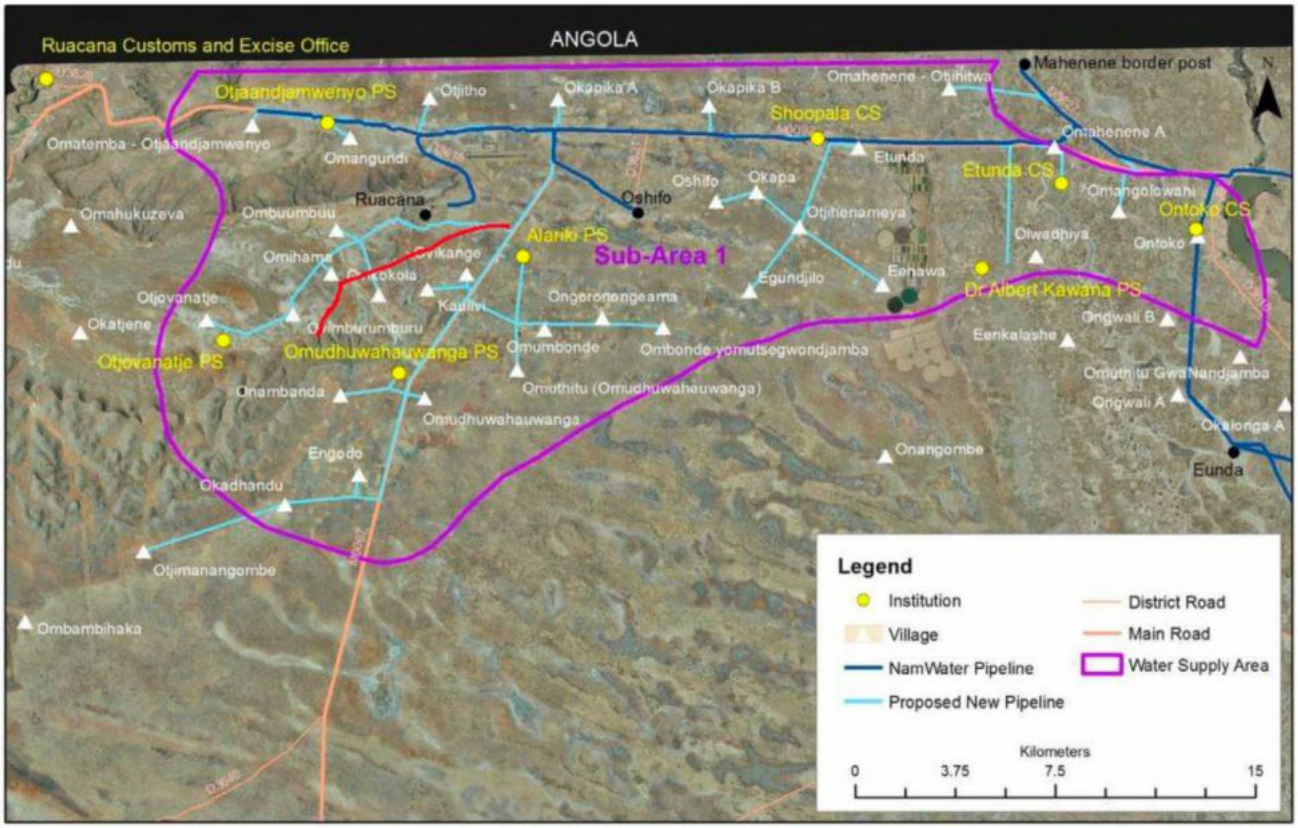

Figure 2: RSWSP Phase 1 Sub-Area 1 project area map. Source: LCE, 2022[2].

The details of the Phase 1 Sub-Area 1 of the project are presented below.

[1] LCE, 2022: "*Ruacana South Water Supply Project: Phase 1: Preliminary (Concept) Design Memorandum Report*" submitted to Ministry of Agriculture, Water and Land Reform for the Namibia Water Sector Support Program (NWSSP). Contract No. P-NA-E00-005, by Lund Consulting Engineers CC (LCE), Windhoek, November 2022.

[2] LCE, 2022: "*Ruacana South Water Supply Project: Phase 1: Preliminary (Concept) Design Memorandum Report*" submitted to Ministry of Agriculture, Water and Land Reform for the Namibia Water Sector Support Program (NWSSP). Contract No. P-NA-E00-005, by Lund Consulting Engineers CC (LCE), Windhoek, November 2022.

- Phase 1 Sub Area 1: Comprises of the extension and upgrading and installation of new pipeline, booster pumps and reservoirs for the rural water supply network in Onesi and Ruacana South Constituencies. The Phase 1 will cover an area of approximately 46,500ha. Some of the areas covered in Phase 1 includes villages in Eunda in Onesi Constituency, Oshifo and the villages surrounding them, Ruacana South, and the villages close to the Angola/Namibia border (see Figure 2). Details of the pipeline route for Phase 1 Sub-Area 1 are presented in Figure 3.

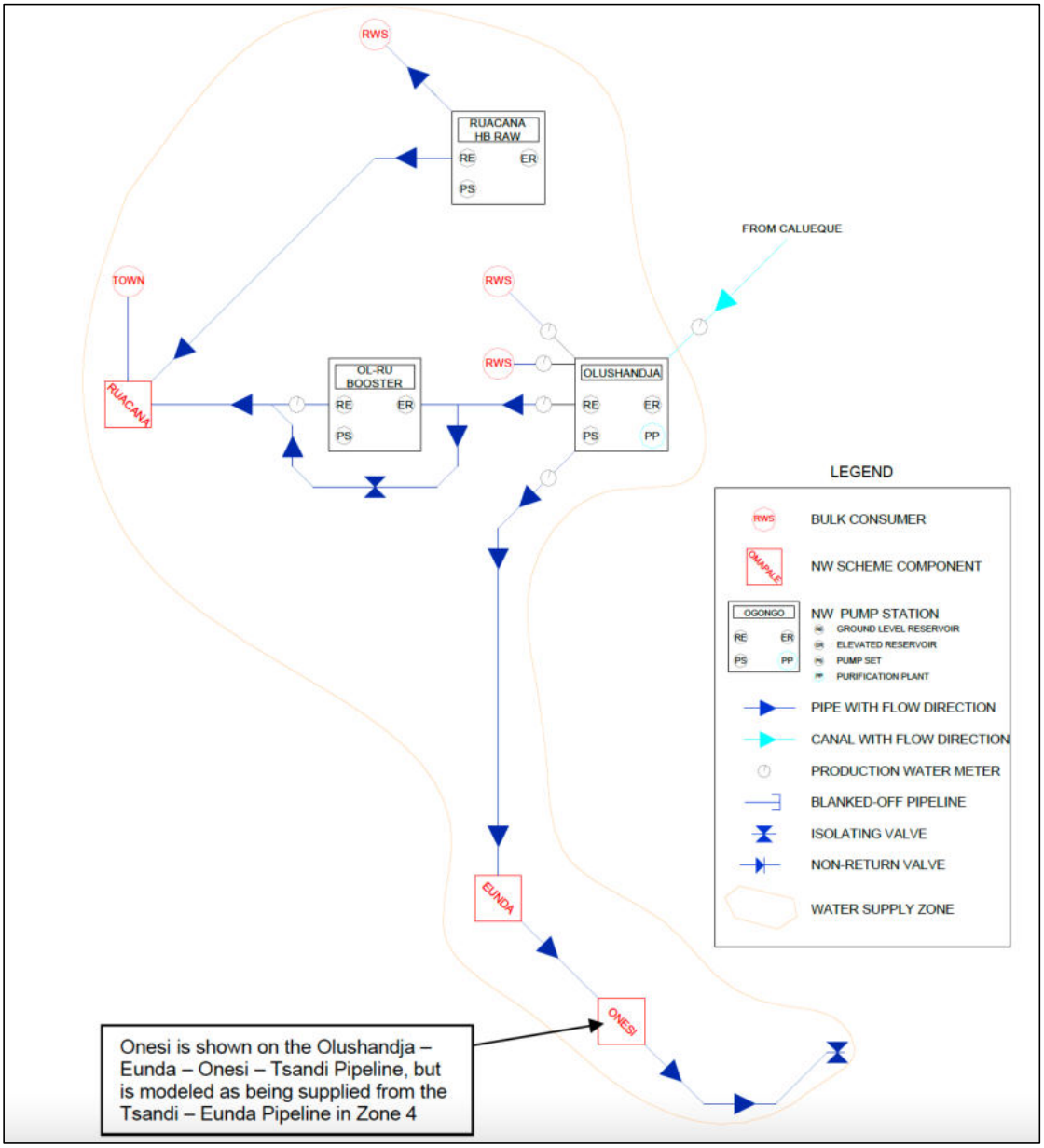

Figure 3: Schematic Layout of NamWater's Infrastructure of Zone 2 which is covered by Phase 1 Sub-Area 1. Source: LCE, 2009[3].

1.3. Need and Desirability of the Project

[3] LCE, 2009: "*Water Supply Infrastructure Development and Capital Replacement Master Water Plan for the Central North Water Supply Area*", Report for the Infrastructure Planning Division of the Namibia Water Corporation Ltd. (NamWater), Report No. NWC-IPNZWW106, by Lund Consulting Engineers CC (LCE), Windhoek, September 2009

Water insecurity continues to be a serious constraint in achieving the economic, environmental and social development agenda in Namibia. Although the overall percentage distribution of households with access to safe water for the country is relatively high (92.9%), that percentage in the project region is below the national value, stood at 85.6% in 2017[4]. Within the project areas, households with access to safe water is currently over 80%.

Surface water in the study area which accumulates in the *iishana* is used for livestock watering and domestic use before the *iishana* dries up. It typically dries up during winter months, after which no surface water is available until the next rainy season. Shallow, hand-dug wells are located throughout the Project Area, from which water is drawn after the *iishana* have dried up. Some of these wells however, also dry up during the winter months. Groundwater is not everywhere of potable quality and individual borehole yields are often low in relation to the specific community demands. The groundwater quality is highly variable in the Project Area. In the north-western area, around Ruacana, the quality is good (Class A or B) and in the eastern area, sulphate, magnesium and calcium concentrations are sometimes problematic. Locally, nitrate and fluoride concentrations are also above acceptable consumption thresholds. It is important to note that due to the shallow water levels, this groundwater is highly vulnerable to contamination by livestock droppings, which is confirmed by the locally encountered high nitrate concentrations. The proposed project is therefore, aimed to cover critical, urgent water supply infrastructure development in these parts of the Omusati Region.

The availability of clean water will boost local economy and promote investment capacity in the areas. Moreover, access to safe drinking water reduces the burden on women and girls from water collection over long-distances, giving them more time for focus on economic and productive endeavours. Access to potable water reduces the risk of assault for women, girls, marginalised and vulnerable groups when collecting water[5]. The SESA of NWSSP also notes that improved health from the availability of water and reduced water-carrying burdens improve school attendance, especially among girls. The time lost because of long-distance water collection and poor health contributes to poverty and reduced food security.

1.4. Project activities that trigger EMA requirements.

The proposed RSWSP Phase 1 upgrade and its associated activities, such as installations of pipelines, reservoirs and pumping stations are listed activities that cannot be undertaken without an Environmental Clearance Certificate in accordance with the Namibia's Environmental Assessment Policy, Environmental Management Act (EMA) No. 7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulations. In this respect, proposed development and associated activities require a specific Environmental and Social Impact Assessment (ESIA) Study prior to implementation.

The relevant listed activities that trigger the ESIA Study are as follows[6]:

Listed Activity 8. Water Resource Developments

[4] 2016 data from NSA

[5] UNESCO-WWAP, 2006: UN World Water Development Report 2006. URL: https://en.unesco.org/themes/water-security/wwap/wwdr/series

[6] Ministry of Environment, Forestry and Tourism (MEFT). 2012: *Environmental Management Act No. 7 of 2007'S EIA Regulations*. Windhoek: Directorate of Environmental Affairs, Ministry of Environment and Tourism

- 8.2 The abstraction of groundwater at a volume exceeding the threshold authorized in terms of a law relating to water resources.
- 8.3 Any water abstraction from a river that forms an international boundary.
- 8.4 Construction of canals and channels including the diversion of the normal flow of water in a riverbed and water transfer schemes between water catchments and impoundments.

Listed Activity 10. Infrastructure

- 10.1 The construction of - (a) oil, water, gas and petrochemical and other bulk supply pipelines, (b) public roads

Associated Listed Activities will include:

Listed Activity 4: Forestry Activities

- 4.0 The clearance of forest areas, deforestation, afforestation, timber harvesting or vegetation on a sand dune that requires authorisation in terms of the Forest Act, 2001 (Act No. 12 of 2001).
  Applicability: potential clearing of vegetation to make way for the pipelines and associated infrastructures.

Listed Activity 5: Land Use and Development Activities

Applicability: potential use of land to make way for the pipelines and associated infrastructures.

Subsequently, an ESIA Study for the proposed water infrastructure upgrade and construction needs to be conduct by an independent Environmental Consultant to ascertain potential environmental and social impacts (both positive and negative) and establish how to improve or mitigate these impacts.

The ESIA study will present the description and analysis of the physical and biological shall address relevant environmental, social and climate change issues within this area, including any changes anticipated before project implementation. The description shall also integrate human conditions including population characteristics and trends, revenue disparities, gender differences, health problems, natural resource access and ownership and land use patterns biophysical and socio-economic baseline investigations relating to the proposed project.

All identified impacts will be described and addressed in the Environmental and Social Impact Assessment report and mitigated in the Management Plan (ESMP). These will follow the Environmental Management Act (EMA) No. 7 of 2007, the Environmental Assessment regulations of 2012 (Government Notice (GN) 30 in GG 4878 of 6 February 2012), the African Development Bank (AfDB) Environmental and Social Assessment Procedures (ESAP) 2015 and the Integrated Safeguards System.

1.5. Aim of the ESIA Study

This ESIA Study aims to:

- Provide an overall assessment of the social, physical and biophysical environments in the area that are likely affected by the project including sensitive archaeological and heritage sites and resources in the project area;

- Undertake a detailed environmental assessment, in terms of environmental criteria and impacts (direct, indirect and cumulative), and recommend a preferred location for the sand abstraction sites, water abstraction and road right of way based on environmental and social sensitivity);
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts;
- Undertake a fully inclusive Public Participation Process (PPP) to ensure all interested and affected parties participate in the project planning and development to improve implementation of the project.
- GIS sensitivity mapping to identify potential impacts, propose mitigation and inform the sensitivity analysis.

A systematic approach was adopted to successfully complete the ESIA in line with the regulation process.

1.6. The Environmental Assessment Practitioner (Consultant)

To fulfil the requirements of the EMA and its Regulations and the AfDB ESS, MAWLR appointed D&P Engineers and Environmental Consultants (a team of Independent Environmental Consultants / EAPs) to apply for the ECC and conduct the required ESIA process. The ESIA process, including public and stakeholders' consultations and engagements as well as compilation of the associated documents were conducted and compiled by Dr. Luckson Zvobgo, a qualified Water Resources, Climate Change and Environmental Assessment Practitioner with over seven years' experience in the Environmental, Climate and Water Resources Management consulting industry. Dr. Zvobgo was assisted by two Junior EAPs (Ms. Kristian Shiwayu and Mr. Adiel Mudzanapabwe). The Study is overseen and managed by the Lead EAP, Mr. Tendai Kasinganeti, a qualified and experienced EAP and Climate Change Policy specialist with 9 years of consulting experience. The CVs of Dr. Zvobgo and Mr. Kasinganeti are appended hereto as Appendix G.

1.7. Terms of Reference and Scope of Work for the ESIA Study

The scope entails the process followed in pursuit of obtaining an ECC for the proposed project (development) which are phased in two stages, namely the scoping stage, and detailed ESIA stage. These were carried out in accordance with the existing, relevant and governing standards. The scope of work for the current ESIA entails the following, as also presented in the Terms of the Reference for this project's ESIA Study:

- Environmental Baseline Assessment and Mapping
- Public and Stakeholders Consultation and Disclosure
- Environmental Scoping Report (with specialist inputs)
- Institutional, policy and regulatory framework review
- Environmental aspects identification and impacts ranking and determine the need for specialists.
- Detailed/Full Environmental and Social Impact Assessment (DESIA) with specialist inputs
- Conduct Specialist Assessments where required (Socio-economic, hydrogeological, archaeological, land use planning/resettlement)
- Capacity Building Framework
- Gap Analysis (institutional and technical)
- Develop a Grievance Redressal Mechanism (GRM)

- Develop if required an Abbreviated Resettlement Action Plan (ARAP)
- Develop a costed Environmental and Social Management Plan (ESMP)
- Develop an Environmental and Social Monitoring Framework
- Monitoring, Evaluation, Assessment and Learning Framework.

Furthermore, the scope of work for the ESIA development included the applicable standards enshrined in the AfDB Integrated Safeguards System (ISS) policies and as per the EMA No. 7 of 2007 and the 2012 EIA Regulations as the overarching guideline documents.

ESIA development was also guided by the following guides and standards:

- International Finance Corporation (IFC) Environmental and Social Standards, and
- International Conventions and Protocols to which the Namibian Government is a Signatory such as the UN Framework Convention on Climate Change, etc., and International Convention on Biological Diversity.

At national level, after submitting an application for ECC to the DEAF, the first stage in the ESIA process is to submit an Environmental & Social Scoping Report and a separate ESMP. For the purposes of the lender (AfDB) requirements, an ESIA shall be submitted and reviewed for risk assessment and management purposes. This represents the ESIA per AfDB requirements. The Table 1 explains the contents of the report:

Table 1: Description of the outline of the ESIA report.

Description	**Section of the Report**
Introduction and Background of the project including aims and ToR	Chapter 1
Approach and Methodology for the ESIA Study	Chapter 2
Description of Project Activities	Chapter 3
Alternatives considered for the proposed project in terms of no- go option, design, route and service and infrastructure	Chapter 4
The applicable legal framework (laws, policies and guidelines) pertaining to the project	Chapter 5
Description of the receiving environment: biophysical and social environments in which the proposed activity will be carried out	Chapter 6
The public consultation and engagement activities (as described in Regulation 7 of the EMA Act)	Chapter 7
The identification of potential impacts, impact assessment methodology, impacts description, and assessment. The management and mitigation measures are provided in the ESMP.	Chapter 8
Environmental and Social Management Plan	Chapter 9
Rehabilitation and monitoring plan	Chapter 10

2. APPROACH AND METHODOLOGY FOR THE ESIA STUDY

The ESIA was done to ensure that environmental and social issues are considered during RSWSP Phase 1's development and implementation, i.e., planning, design, construction and operational phases. The study used a participatory approach involving wider consultation with interested and affected stakeholders and or parties, non-governmental organizations (NGOs, line ministries, local authorities, the implementing agencies - MAWLR and NamWater) and primary beneficiaries and their political and traditional representatives. This was done to ensure that the locals from the project communities in the areas are included in the process.

In addition, the D&P Environmental Consultants has been involving the Planning Engineers (Lund Consulting Engineers - LCE) throughout the ESIA process to provide guidance on important considerations in design that may relate to environmental and social risk factors identified.

To ensure successful completion of the ESIA Study and obtain the ECC for the proposed project, the overview of the adopted ESIA process is shown in

Figure 4.

Assumptions and Limitations

Like any other study, the current ESIA study had assumptions to it as well as the limitations of the processes. The following assumptions and limitations underpin the approach to this ESIA:

- The information received from the stakeholders, desktop review and baseline assessments are current and valid at the time this study was conducted;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the reports by the competent authority and other government departments; and
- No land claims have been registered for the proposed site at the onset and registration of the study.

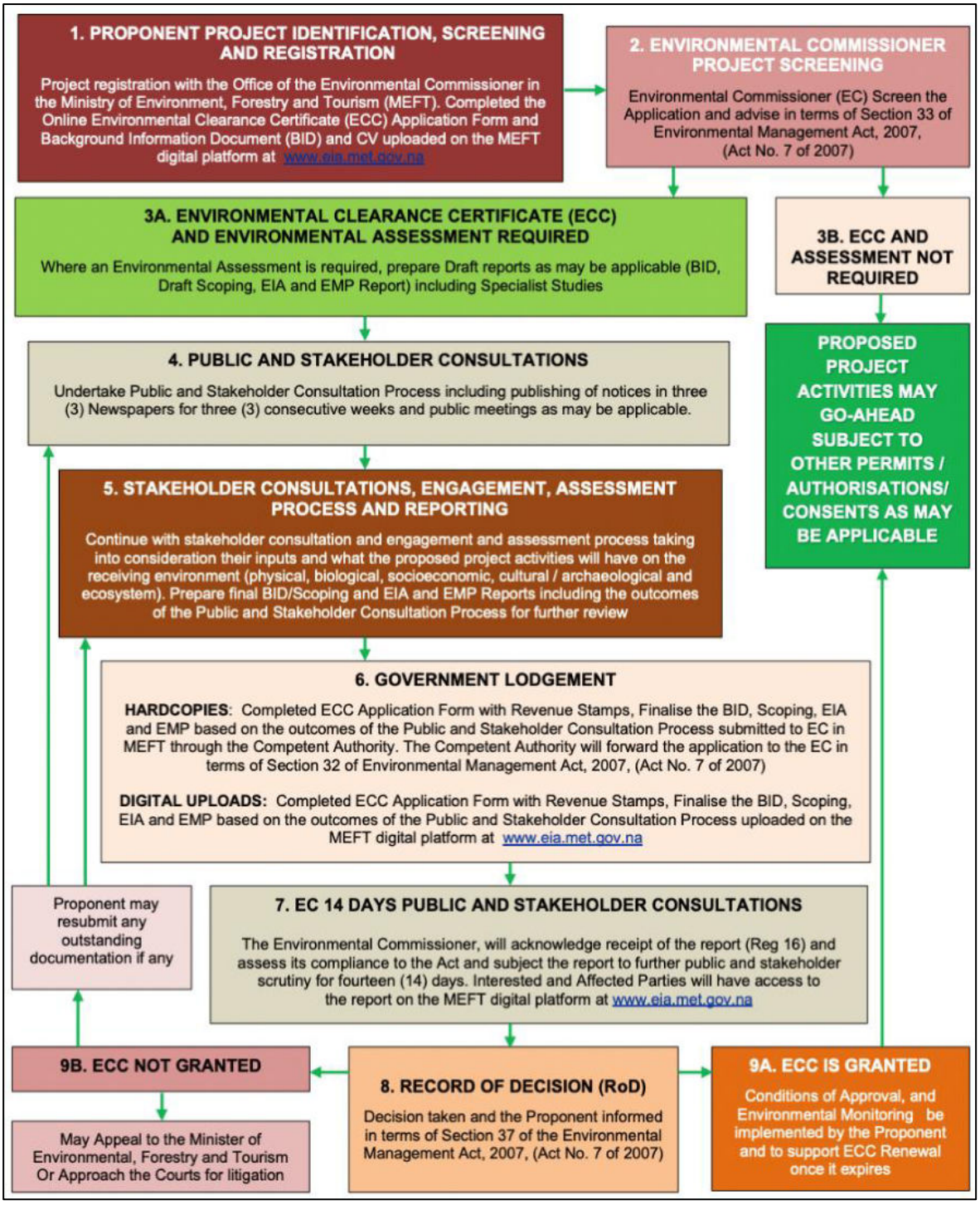

Figure 4: The EIA methodological process in Namibia that was followed during the project ESIA Study development.

As highlighted in the Introduction, the Environmental and Social Management Framework (ESMF) of the NWSSP specifies the current program activities such as the Ruacana South Phase 1 as Category 1 of the

AfDB's Operational Safeguards System – ESS implying that the projects' impacts are likely to have detrimental site-specific environmental and social impacts. Thus, requirements to minimize identified and evaluated significant impacts by undertaking a scoping assessment.

2.1. ESIA Study Inception

Inception meetings were held with the project implementing agency (MAWLR) and the Planning Engineer. The meetings aimed at confirming the project participants and teams, confirmation of the ESIA Study schedule and agreement on milestones. The meeting with MAWLR also clarified aspects of the technical proposal for the ESIA Study and set up liaison and communication procedures. The inception meetings also allowed for pre-identification of key stakeholders for consultation and set procedures, venues, and dates for public consultation processes.

The available latest background information on the project were obtained from MAWLR, and these included the following:

- Proposed infrastructure location and maps;
- Preliminary design (received by the Environmental Consultant from LCE)
- Relevant project information and past reports (also provided by LCE).

The Environmental Consultant prepared the meeting minutes and distributed these to the participants for comments before adopting the contents of the discussion as mutually agreed.

2.2. Preliminary Assessment and Desktop Review (Project Screening and Baseline Assessment)

The various relevant existing latest data including those received at the start-up meeting were studied in preparation for the site visits. This data include inter alia:

- Aerial photographs (of sufficient clarity to decipher details at the appropriate scale)
- Flood line and rainfall data and maps.
- Community information.
- Sensitivity mapping.
- Census data and statistics.
- Applicable water supply master plans.
- Cadastral maps of towns and settlements.
- Planned development initiatives in the project area.
- AfDB manuals and guidelines.
- Namibian legal and policy frameworks.

The data above has been analysed in an integrated manner and multiple requirements incorporated in the most feasible possible way. Following this, options were able to be devised for detailed investigation and anticipate potential risks and strategies to mitigate their impacts.

2.2.1. Literature Review

Literature of national and regional reports, maps and publications pertaining to the project site area on topography, climate, land use, and socio-economic setup was reviewed to collect baseline information, alternatives, how to mitigate the impacts, decommissioning, and rehabilitation plan. The literature review helped in undertaking components and areas that would deserve attention during field assessment.

2.2.2. Site Reconnaissance Visit

The site reconnaissance was undertaken concurrently with the data collection and analysis. This was done for the Environmental Consultants with the project environments and carry out a site baseline inspection. The key environmental fatal flows were noted to help with preparation of preceding processes such as public consultation. All relevant project site infrastructure such as existing reservoirs, pump stations, pipelines and other key facilities were assessed. The anticipated pipeline right of way and supply sites were assessed to identify associated environmental flaws (if any fatal flaws will be experienced), assess if there is any form of ARAP required due to displacement water infrastructure development, and loss of land supporting livelihoods.

The site reconnaissance visit was conducted concurrently with public consultation meetings (see Chapter 4). The objectives of site reconnaissance visits consisted of:

- Familiarisation with the project environment.
- Confirm and review early assumptions from the desktop study.
- Investigation and traversing of route alignment options from desktop analysis.
- Identify community focal points and consultative areas.
- Initiate the environmental scoping for the EIA process.
- Identify any major/key environmental fatal flaws.
- Investigate locations of required offtakes.

2.2.3. Legislative Frameworks Compilation

A preliminary Policy, Legal and Administrative review was conducted during the initial stages of the study. This was to ensure that any preceding activities and assessment are conducted in compliance to the required legal frameworks and within the AfDB's standard guidelines and policies. The legal compilation was put together for the assessment guiding document which include but not limited to:

- Relevant national (and institutional) laws
- AfDB standards for ESIAs.

2.2.4. Identification and mapping of Environmental sensitivities

A rapid environmental screening was conducted at the project site to identify any key environmental and social fatal flaws that may be triggered by the proposed project. Preliminary sensitivity mapping was also used to identify any major fatal flaws that may significantly affect assessment plan and structure.

2.3. Public and Stakeholders Consultation and Disclosure

The consultation process was crucial in this assignment as it establishes who the stakeholders and I&APs and the engagement procedures. All pre identified stakeholders were notified and afforded an opportunity to register and provide comments to the study (see Chapter 4). Apart from MAWLR and NamWater, the EAP identified other key stakeholders such as Regional and local leadership in the region, as well as specific interest groups

that would benefit or be affected by the project were consulted. The stakeholders, I&APs were consulted using various means (see details in the Public Engagement Chapter 4)

2.3.1. Public Consultation and Disclosure

A Public Consultation and Disclosure Plan (PCDP) is required for the ESIA Study, which was used to (i) describe local requirements for consultation and disclosure; (ii) identify key stakeholder groups; (iii) provide a strategy and timetable for sharing information and consulting with each of these groups during various phases of the project; (iv) describe resources and responsibilities for implementing the PCDP activities; and (v) detail reporting/documentation of consultation and disclosure activities. This methodology is outlined below and under the Consultation/Participation and Engagement Chapter.

2.3.2. Detailed Stakeholders Mapping and Analysis

The EAP provided an inventory of key stakeholder groups who were informed and consulted about the project. Key stakeholders can be affected communities, local organizations, NGOs and government authorities, politicians, commercial and industrial enterprises, labour unions, academics, religious groups, national social and environmental public sector agencies and the media.

The stakeholders' mapping exercise was participatory through using data from the reconnaissance site visit and consultation with MALWR on key stakeholders, implementing agencies and past engagements. The main stakeholders and interested & affected parties (I&APs) are as follows:

- MAWLR: Directorate of Water Resources Management
- MAWLR: Directorate of Water Supply and Sanitation
- NamWater
- Ministry of Environment, Forestry and Tourism and representatives
- Regional and local authorities; Omusati Regional Council, Constituency Offices, Town Council, Settlements offices, and respective Traditional Authority
- Village Development Committees (VDCs)
- NGOs and, CBOs
- Primary beneficiaries / community representatives.

To ensure that there is adequate circulation of project information, public meetings and project development proposals, a series of notification processes were held/conducted. Therefore, to effectively reach out to all stakeholders and Potentially I&APs, the modes of information sharing and notification during the ESIA Study are listed below:

2.3.3. Newspaper Announcements

As per the Environmental Management Act No. 7 of 2007, I&APs were notified through advertised notices for two weeks in *The Namibian* and *New Era* newspapers (in English Language).

2.3.4. Site Notices, Radio and Community Announcements

Site notices were erected within the project area and at strategically located information places. The site notices (A2) were be erected along the pipeline route, reservoir construction sites and administrative offices. The notices informed the I&APs about the ESIA process and provided details of the public meetings and commenting period.

The EAP coordinated with local community traditional leadership and constituency councilors to spread information about the project and consultative exercises. The notices were prepared in English for conveying in local languages by the Councilors and Traditional leadership through radio announcements.

2.3.5. Background Information Document (BID)

A Background Information Document (BID) with detailed information on proposed project containing information on preliminary investigations, processes to be followed, and explain how I&APs can become involved in the project. The document was distributed to all pre-identified Interested and Affected Parties prior to consultation meetings and copies of the BID were also distributed in consultation meetings.

2.3.6. Public and Stakeholders' Consultation Meetings

Consultation meetings were conducted with stakeholders and the affected communities at large along the project route. These were held in a form of face-face meetings, questionnaires (attached to the BIDs), interviews and focus group discussions, depending on their nature, interests and roles and responsibilities in the project area. The public consultation process also ensured that feedback meetings are held in target areas and affected areas to ensure that the scoping phase and reports are aligned to issues discussed and identified. This also allowed for the design engineer to confirm which ideas/alterations/improvements need to be incorporated into the final designs. From the consultation meetings, an issues/comments trail register was created to allow for tracking of issues raised by I&APs.

2.3.7. Feedback Meeting and Reports Validation

The draft Scoping Assessment report, ESMP and specialist assessments/inputs will be shared with the MAWLR, AfDB, project engineers, and the receiving communities for review and comment.

2.4. Environmental Scoping Phase

The Environmental Management Act No. 7 of 2007 requires that initial Environmental Scoping Report (ESR) / Environmental & Social Scoping Report (ESSR) is developed and submitted to the Environmental Commissioner (EC) in the Directorate of Environmental Affairs of the MEFT. The ESR was informed by desk review of existing literature and previous ESIA reports including the 2019 SESA report and its ESMF prepared for the NWSSP.

Furthermore, the five AfDB safeguard requirements that clients are expected to meet when addressing social and environmental impacts and risks were thoroughly engaged and informed the study. These includes:

- Operational Safeguard 1 - Environmental and social assessment
- Operational safeguard 2 – Involuntary resettlement: land acquisition, population displacement and compensation
- Operational safeguard 3 – Biodiversity, renewable resources and ecosystem services
- Operational safeguard 4 – Pollution prevention and control, hazardous materials and resource efficiency
- Operational safeguard 5 – Labour conditions, health and safety.

The ESR also further provides a detailed description of the receiving environment, covering biophysical, social, economic and political issues surrounding the project area as detailed in the NWSSP' SESA.

Climate resilience and gender issues has also been articulated to ensure that climate sustainability and gender inclusion are key to the project implementation. Pre-identification of environmental and social aspects of the project is conducted during the scoping phase, to ensure that any affected aspects are clearly articulated and

documented. Consequently, environmental impact assessment has been conducted. Using the IFC regulated Environmental and Social impact Assessment matrix, 2012.

2.4.1. Data and information Sources

A lot of data was accessed and informed the development of the scoping report. The included both primary data (field observations and consultations) and the secondary data (project literature documents and other relevant documents including national and sectoral policies, laws and strategies). Some of the data sources in summary consists of:

- General site layout, designs and routes
- Local authority planning maps, schemes and strategic development documents.
- Demographic data, population distribution and growth estimates
- Waste quantities and characteristics
- Current needs and challenges (gender, youths, climate, socio-economic)
- Water resources
- Fauna and flora
- Archaeological and cultural heritage
- Sensitive receptors-GIS mapping and remote sensing analysis

The scoping study has addressed basic project information including: the general features and parameters of the proposed project; a basic outline of the required project scope and anticipated benefits and potential adverse impacts; and the status of technical issues. The study also identified what areas would require further detailed and / or specialist studies (hydrological, environmental, ecological waste management, social impact assessment (including possible resettlement action plan), socio-economic impact assessment, geohydrological study, air quality assessment, noise and vibration studies, cultural/archaeological assessment, etc. and would provide an assessment of the completeness and level of confidence in existing data.

This scoping Report provides information to the public and stakeholders to aid in the decision-making process for the proposed project. The objectives of the scoping report are to:

- Provide a description of the proposed project and the site on which the activity is to be undertaken, and the location of the project on the site.
- Provide a description of the baseline environment that may be affected by the activity based on literature review (i.e. desk study).
- Identify the laws and agreements that could impact on the project (or vice versa) and that have been considered in the assessment and preparation of this report.
- Provide details of the public consultation process (comments and response trail).
- Describe the need and desirability of the activity.
- Provide a high level of environmental and social impact assessment on feasible alternatives that were considered.
- Report the assessment findings, identifying the significance of potential impacts and which potential impacts warrant further investigation.
- All the specialist studies conducted during execution of the assessment.

2.4.2. Environmental Scoping Report

The guide from the NWSSP' SESA and ESMF are among the documents used to inform these decisions, as the strategic assessment conducted previously for the platform gives a clear -cut cross impacts and aspects matrix. Scoping has been used to identify which potential impacts are relevant/significant to assess. The extent or depth of assessment (based on legislative requirements, international conventions, expert knowledge and public involvement), to identify alternative solutions that avoid, mitigate or compensate adverse impacts on biodiversity (including the option of not proceeding with the development, finding alternative designs or sites which avoid the impacts. Identification of safeguards and incorporating grievance redressal mechanisms in the design of the project or providing compensation for adverse impacts) was also included. The final derivation of the ToR for the ESSR was also based on these findings.

Project risks and opportunities in the areas of technical, environmental, social, and other concern were identified and analysed based on the following, but not limited to:

- Current water supply and sanitation services status quo in the project area
- Gaps, shortfalls and challenges related to the above
- Demographics of the project area
- Socio-economic status of the project area
- Institutions' roles and capacities in the project area
- Site and route selection and alternatives
- Possibility of people's displacement and resettlement
- Site clearance and fencing
- Bulk earthworks and civils
- All mechanical and electrical work
- Chemicals to be used for treatment processes
- Solid and liquid waste disposal, including opportunities for recycling
- Air emissions (dust during construction)
- Bulk water pipelines
- Road access infrastructure and alternatives
- Housing (temporary)
- Construction yard, workshops and laydown areas
- Construction workforce and permanent workforce
- Sustainability of groundwater abstraction
- Review and evaluation of recommended groundwater abstraction rates
- Any other issue not listed above but identified as a concern.

The ESR also details the proposed mitigation options for all identified impacts. The resultant ESR was shared with the Design/Planning Consulting Engineers (LCE), MAWLR's Project Manager for the construction phase and for operations, NamWater's Project Manager, MAWLR environmentalist and AfDB for review and comments. The final ESR with inputs from MAWLR and AfDB were shared with public, I&APs and stakeholders for review and commenting.

2.4.3. Specialist Assessments

D&P Engineers and Environmental Consultants assessed the environmental acceptability of the proposed project and associated infrastructure. Additionally, the Consultant optimized the project site and pipeline routes, taking into consideration all aspects of the environment and shall indicate all possible mitigation measures. The consultant undertook the following specialist studies:

A. Fauna and Flora (Specialist assessment) – APPENDIX A

A fauna and flora study was commissioned and species in the area was identified and assessed. Field transacts and GIS maps were conducted to establish vegetation types, plants, mammals, arthropods, reptiles and bird's species. The survey provided information on general occurrence of species diversity and identify species of conservation concern. The assessment covered the following:

- Describe the natural environment in terms of climate, basic geology/soil conditions, topography, water drainage features, ecology and any other environmental conditions.
- Desktop assessment to identify potential priority species, habitats, ecological corridors, and protected areas, including international, national, regional and local datasets and plans.
- Undertook a field survey and identify all species observed in the study area fauna (including avifauna) and flora.
- Provide a description of each habitat type including dominant, indicator, threatened, protected and rare (including regional and local endemic) species, vegetation communities and or habitats.
- Compiled list of invasive species, Red List, protected and/or endemic species for each flora and fauna (including avifauna) community.
- Document the status of all relevant species (e.g. IUCN Red List, national or local protection status, regional and local endemism etc.).
- Identify and assess all ecological impacts (direct, indirect and cumulative) of the construction and operational activities of the proposed development on flora, fauna (including avifauna).
- An impact summary table must be provided, discussing expected impacts before and after mitigation.
- Propose mitigation measures considering ecological impacts identified including monitoring indicators. Ensure that mitigation measures are practical and measurable.
- List specific legislation and permit requirements that are relevant RSWSP.

B. Culture and Heritage sites (specialist assessment) – APPENDIX B

The Heritage and archaeological impact assessment was conducted that identified and locate sensitivities of heritage resources within the limit of the project area that could be negatively affected by the project development.

The assessment established significant heritage resources and their vulnerability, estimate the extent of possible impacts, establish cumulative impacts and suggest practical management actions for heritage resources conservation.

C. Socio-economic Assessment – Scoping Report

The approach to the Social Impact Assessment Study is based on IFC Principles on Environmental and Social Safeguards. These guidelines are based on international best practices. The key activities in the SIA process are to be detailed as follows:

- The Consultant conducted public consultation process as per requirements set out in the Environmental Management Act, 2007 of Namibia and Environmental Impact Assessment Regulations of 2012.

- The consultant was responsible for all the documentation, communication and facilitation of the public consultation process.
- Identify and describe the characteristics of the receiving social environment in terms of but not limited to; demographic profile, education, healthcare, housing, water, sanitation, electricity and employment profile.
- Advertise the project and the Public Consultation Process (PCP) in all major local newspapers and other media as appropriate.
- Identify, arrange and facilitate public meetings to be held as well as the venues for these meetings.
- Compile minutes of the meetings and send to all participants.
- Collect baseline data on the current social and economic environment.
- Identifying and collect data on key potential adverse social issues associated with the proposed project through consultation with affected individuals and communities.
- Assess and document the significance of social impacts associated with the proposed intervention; and Identifying alternatives and mitigation measures. In this regard the study involved. Impact rating and significance of impacts: the World Bank IFC methodology[7] was employed to assess the significance of the identified project adverse impacts. The impact rating was key in discussing the appropriate corrective or mitigation measures in the ESMP.
- Review of project related information, including other specialist studies.

D. Climate Change Risk Assessment - Scoping Report

Mainstreaming of climate change impacts was conducted to provide baseline data on climate variability impacts on the project. The following activities were conducted:

- Analyze potential in-combination effects of both project and future climate change on receiving environment with a focus on location and operational impacts.
- Analyze Greenhouse Gases (GHGs) performance.
- Analyze resilience of project design features, construction materials and planned operational processes to the predicted consequences of climate change.
- Recommend mitigation, compensation, enhancement and monitoring related to projects predicted in-combination impact with climate change.

Recommend mitigation, compensation or monitoring related to project GHGs emissions.

2.4.4. Environmental & Social Management Plan (ESMP)

The finalized ESR determines the need for further specialist assessments, where there is no need for further assessments (Specialists) a detailed practical and concise ESMP was developed.

The objective of the ESMP was to ensure compliance with the EMA No. 7 of 2007, AfDB Environmental and Social Safeguards, Equator Principles, the IFC Performance Standards on Environmental and Social

[7] International Finance Corporation, (2012). *Guidance Notes to Performance Standards on Environmental and Social Sustainability*. World Bank Group. URL: https://www.ifc.org/content/dam/ifc/doc/2010/2012-ifc-performance-standards-guidance-note-en.pdf

Sustainability. The Environmental Consultant / EAP developed an ESMP which follows on environmental flaws associated with the proposed project, which were identified through the ESR. The ESMP stipulates the organizational structure, planning and monitoring for environmental protection at the proposed farm area development and other areas of its influence. The aim was to ensure that the proponent maintains adequate control over the project operations to:

- Prevent negative impacts where possible.
- Reduce or minimise the extent of impact during project life cycle.
- Prevent long-term environmental degradation.
- Ensure public safety and health is protected.

The ESMP articulates the need to clearly outline the roles and responsibilities of all stakeholders involved to ensure that the EMP is fully implemented, thus ensuring full compliance and monitoring during different project phases. The ESIA and ESMP are submitted as follows:

- HARDCOPIES: Completed ECC Application with Revenue Stamps, final BID, Scoping report, ESIA and ESMP based on the outcomes of the ESIA process. All documents are submitted to the Environmental Commissioner at MEFT through the identified competent Authority (MAWLR).
- DIGITAL UPLOADS: Completed ECC Application with Revenue Stamps, final BID, Scoping report, ESIA and ESMP based on the outcomes of the ESIA process. All documents are uploaded on the MEFT portal at www.eia.met.gov.na
- As regulated by the EMA No. 7 of 2007, where the ESR is not sufficient in addressing and detailing all identified impacts, a full/detailed ESIA is to be commissioned. The full ESIA combines all previous findings in the ESR since it follows similar procedures and requirements. However, in addition to the ESR there were additional specialist assessment reports that may include vertebrate fauna and flora study, hydrological assessment, geohydrological assessment, archaeological impact assessment, resettlement action plan, traffic impact assessment, avian impact assessment and grievance address plan if required. The findings and recommendations from any commissioned specialist assessment is reviewed and incorporated into the Environmental and Social Management plan (ESMP) that has been developed for the proposed project.

3. PROJECT DESCRIPTION

3.1. Descriotion of RSWSP Project Development Phase

In the context of project development cycle, the current project activities are both in the planning and development phase.

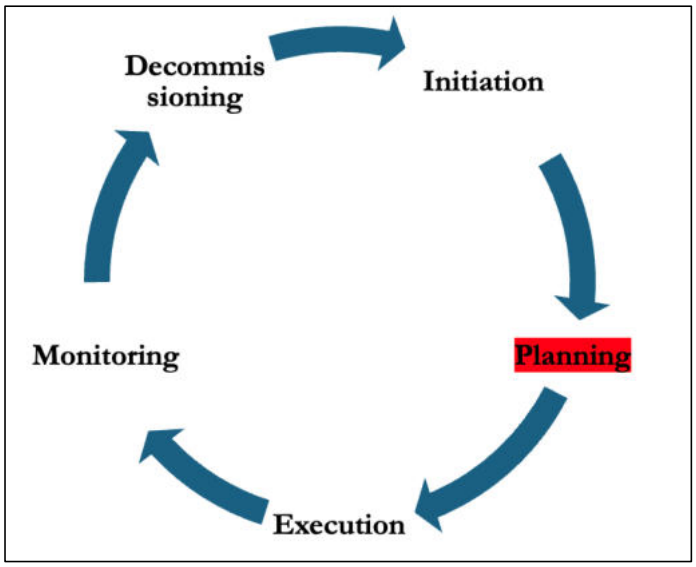

Figure 5: RWSP development phases indicating the current project development phases in the context of project development framework.

3.1.1. Initiation phase of RSWSP

the project initiation started more than two decades back, as far back as 1999 by NamWater and the then Directorate of Rural Water Supply. An initial report was submitted in May 2000.

3.1.2. Planning phase of RSWSP

The planning phase of the RSWSP took place in two phases. First was planning of the existing pipeline and second phase was the planning of the current proposed upgrade (Phase 1). The planning of the second phase of the project implementation started around 2012 with the aim to extend water supply in the study area. Planning and design work during 2014 and 2015 culminated in a construction tender for Phase 1 of the RSWSP. It is at this stage environmental and social issues associated with the project are critically studied to offer inclusivity ensuring that the needs of the communities are taken into considerations, all social issues that may arise from the project are studied including the environmental and socio-economic impacts of the project. This study formed part of the final planning documents. Such studies are important for informing the execution, monitoring and decommissioning phases of the project activities. The associated environmental and social impacts from this stage are detailed in Chapter 8 and the proposed corrective and mitigation measures are detailed in Chapter 9 (the ESMP).

3.1.3. Execution phase of RSWSP

The execution phase of RSWSP Phase 1 would include the upgrade of the pipeline and related infrastructure that are detailed in Section 3.2 below. This phase will have most of the environmental and social impacts (both positive and negative impacts). This is one of the critical development stages in terms of managing the adverse impacts. Implementation of the proposed ESMP is critical at this stage including the monitoring plan provided in the ESMP.

3.1.4. Monitoring Phase of RSWSP

For RSWSP, the monitoring phase consists of the operation of the pipeline throughout its lifespan. Environmental and social issues associated with the project at this stage includes positive social and economic benefits from clean potable water supply including health benefits. Adverse environmental impacts usually arise from the maintenance of the pipeline and related water infrastructure. Negative social issues arise from unequal access to the water during project lifetime including differential water head (pressure in the communities). These impacts are detailed in Chapter 8 of the ESSR. The corrective and mitigation measures for the adverse environmental and social impacts are detailed in the ESMP section.

3.2. Description of Project Activities (designs and construction) for Phase 1: Sub-Area 1

As presented in Chapter 1 of this report, the proposed project involves the upgrading of water supply network in Onesi and Ruacana South Constituencies in Omusati Region. The details of project activities and associated infrastructure were provided by LCE in the Ruacana Water Supply Project: Preliminary (Concept) Design Memorandum report. The relevant project activities are explained in details below.

The following phased approach was recommended for the implementation of the RSWSP[8] (see Figure 1):

1. Phase 1: Piped water supply to the area between the Olushandja Purification Plant in the east to the Ruacana Falls in the west;
2. Phase 2: Piped water supply to the area between Ruacana and Omakange, with a project area 10 km to either side of the C35 Main Road: Kamanjab – Ruacana;
3. Phase 3: Groundwater supply to the area from Omakange to Opuwo, with a project area 10 km to either side of the C41 Main Road: Omakange – Opuwo;
4. Phase 4: Piped water supply to the area from Omakange to Okatseidhi within a corridor extending 10 km to either side.

[8] LCE, 2022: "*Ruacana South Water Supply Project: Phase 1: Preliminary (Concept) Design Memorandum Report*" submitted to Ministry of Agriculture, Water and Land Reform for the Namibia Water Sector Support Program (NWSSP). Contract No. P-NA-E00-005, by Lund Consulting Engineers CC (LCE), Windhoek, November 2022.

This report detailed the project activities for Phase 1, but where necessary and required to reference the other project phases, it shall be done to give context and to give clarity about the environmental and social aspects of the project activities.

The Phase 1 of the project comprises the extension of the water supply between Olushandja and Ruacana and southwards of the pipeline route (as far as Engodo village, thus approximately 16 km southwards towards in Onesi Constituency) and northern side of the project along the Angola border in Omusati Region. The project pipeline route has an expansion area of approximately 520 km^2 (see Figure 2).

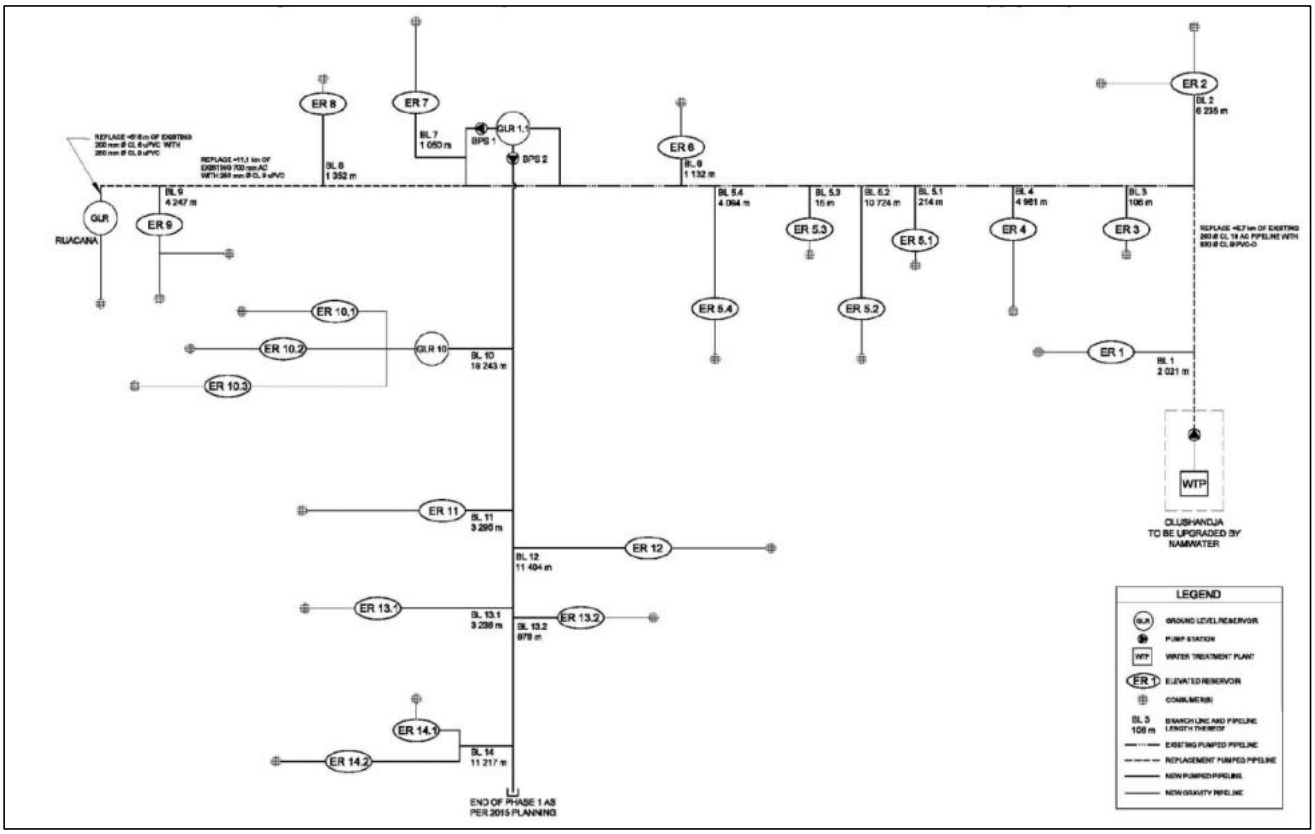

Figure 6: Schematic Representation of RSWSP Phase 1[9].

Water to be supplied into the Project Area through the NamWater's Olushandja Purification Plant, pumped into the Olushandja – Ruacana Pipeline by NamWater's pump station at Olushandja (towards Ruacana). Under the planning and design carried out in 2014/15, a new pump station adjacent to NamWater's Olushandja – Ruacana Booster Pump Station was proposed to replace that existing station (see Figure 6). That new pump station would pump water in two directions:

- Towards the Ruacana Reservoir (at the Escarpment), in the same manner as the existing booster pump station, but with new pumps and motors;
- Into a new pipeline southward alongside the C35 Kamanjab – Ruacana tar road to transfer water towards Omakange but only as far as Engodo village.

[9] Note: The "geographical" and supply extent of Phase 1 shown is that envisaged in 2015, with the component sizing based on the updated / revised 2022 water demands.

The Phase 1 will include the following specific construction activities:

1. Construction of a new booster pump station adjacent to NamWater's Olushandja – Ruacana Booster Pump Station at the junction of the C35 Kamanjab – Ruacana and the C49 Oshakati – Ruacana tar roads, to replace the existing pump station;
2. A new 381 m^3 clean water balancing reservoir at the new pump station;
3. Construction of a new bulk pipeline from the new pump station to the village of Engodo (approximately 16 km with diameters of 250 mm Class 16 (4.658 km) and 200 mm diameter Classes 16, 12 and 9 uPVC);
4. Replacement of a portion of NamWater's existing 700 mm diameter AC, Class 12 pipeline from the Olushandja – Ruacana Booster Pump Station to the Ruacana Reservoir with 250 mm diameter Class 9 (5.013 km) and Class 6 (6.087 km) uPVC pipe;
5. Construction of 14 branch pipelines totaling approximately 89 km, with diameters between 63 mm (uPVC) and 110 mm (uPVC) with pressure classes between Class 6 and 16. A further approximate of 41 km of 50 mm diameter Class 6 HDPE pipeline as envisaged for connections to the water meter manifolds;
6. Construction of one ground level balancing reservoir, 22 elevated reservoirs (15 using LDPE storage tanks and 7 using pressed steel panels) and associated manifold private connections between Olushandja and Ruacana and Ruacana and Engodo.

3.2.1. Construction of New Bulk Pipeline to Engodo

The larger diameter and higher-pressure class throughout (compared with a stepwise reduction in diameter and pressure class previously) are required to transfer the larger water demands associated with the project (compared to those designed for previously in 2015) and because water needs to be supplied into elevated reservoirs near the end of the pipeline.

The new bulk pipeline to the south of NamWater's existing booster pump station is envisaged to feature the following configuration and specifications:

1. The pipeline is envisaged to be located at an off-set of 35 m to the west of the C35 Kamanjab – Ruacana tar road, outside the road reserve which extends 30 m from the road centre line. The road reserve and configuration will be confirmed with the Roads Authority the during detailed design phase;
2. The pipeline will be laid at a cover depth of 900 mm (for a "bulk" pipeline);
3. Connections to the branch pipelines will be housed in concrete and brick manholes and will consist of a tee-piece with thrust block against a concrete wall, isolating valves on the main pipeline and on the branch pipeline, air valves and appropriate fittings (flange adaptors, etc.). The manholes will be provided with a cover slab and circular manhole frame and lid with locking device. The manhole frame and lid will be of composite materials (DMC) 21 in lieu of cast iron to prevent theft. Standard NamWater ID plates will be affixed to each cover slab, to indicate the chainage, pipe type and diameter at each installation;
4. Appurtenances are envisaged as follows:
    a. Air valves, located at peaks / high points, breaks in slope and otherwise at intervals of between 500 m and 800 m. The profile of the bulk pipeline will be adjusted to minimise the number of apex points and hence the number of air valves required, as this will be cheaper than the

increase in excavation costs and provide for a more optimised pipeline profile. Double-acting air valves protected by steel cages bolted to concrete ground (ring) beams per the NamWater standard are proposed. Standard NamWater ID plates will be affixed to each cage, to indicate the chainage, pipe type and diameter at each installation;

b. Isolating valves will be located at intervals of approximately 5 km to allow sections of the pipeline to be isolated during a pipe break or for other maintenance / repair work and to allow testing of the pipeline in shorter sections following construction. These isolating installations will be below ground, housed in concrete manholes featuring a cover slab and circular manhole frame and lid (DMC proposed) with locking device. Standard NamWater ID plates will be affixed to each manhole, to indicate the chainage, pipe type and diameter at each installation;
c. Scour valves will be located in each pipeline section between isolating valves at appropriate low points to allow the pipeline to be drained if required. The installation of a scour tee on the pipeline, a riser pipe and above ground, a resilient seal gate valve and hand wheel protected by a steel cage bolted to a concrete ground beam per the NamWater standard are proposed. Standard NamWater ID plates will be affixed to each cage, to indicate the chainage, pipe type and diameter at each installation;

The following describes the key engineering infrastructure that will be considered for Phase 1 and that have environmental and social impact.

3.2.2. Private Manifold Connections for Rural Communities

Private manifold connections are considered for Phase 1 to the receiving communities in lieu of communal water points which were provided on previous rural water supply projects implemented by the DWSSC (see Figure 7).

The system will consist of the following elements:

1. One metered connection per household or individual not part of a household;
2. Connections would be clustered in a manifold-type configuration:

a. Connections / manifolds would be clustered together in the area of a village;
b. Water meters would be located above ground, protected in a steel cage housing up to six water meters;
c. Multiple cages of six meters would be provided as/where required;
d. Not more than four cages with six meters each would be installed at one connection point to the pipeline;

3. The manifold water meters would be supplied via an elevated reservoir which serves to provide reserve storage and a pressure break between the bulk pipeline and manifold connections, based on the following guidelines;

a. Elevated reservoirs and manifolds were sited based on supply via own pipelines within a radius of 500 m (i.e. households / individuals were not expected to lay pipelines longer than 500 m);
b. Storage provision would be sized for 24 hours' average daily demand at the end of the planning horizon (15 years);
    i. Multiples of 10 m^3 polyethylene tanks would be used up to an including 40 m^3 of required storage (4 tanks);

ii. Volumes greater than 40 m^3 would be provided via sectional steel reservoirs.

c. Elevated reservoirs would be located on stands 6 to 9 m high, depending on the surrounding topography;

4. Each household or individual not part of a household would become a direct NamWater customer, with NamWater to read the water meter and bill that household / individual for their water consumption;

5. The DWSSC would provide all infrastructure up to the water meter of each household / individual and including a 2 m length of pipe to allow the filling of buckets / containers downstream of the water meter. Households / individuals would be responsible for laying a pipeline from "their" water meter to point of residence or use at their own time and cost. Due to the pressure break provided by the elevated reservoir, the system downstream would experience low pressures, thus allowing the use of low-pressure pipelines to reduce the pipeline costs to households / individuals.

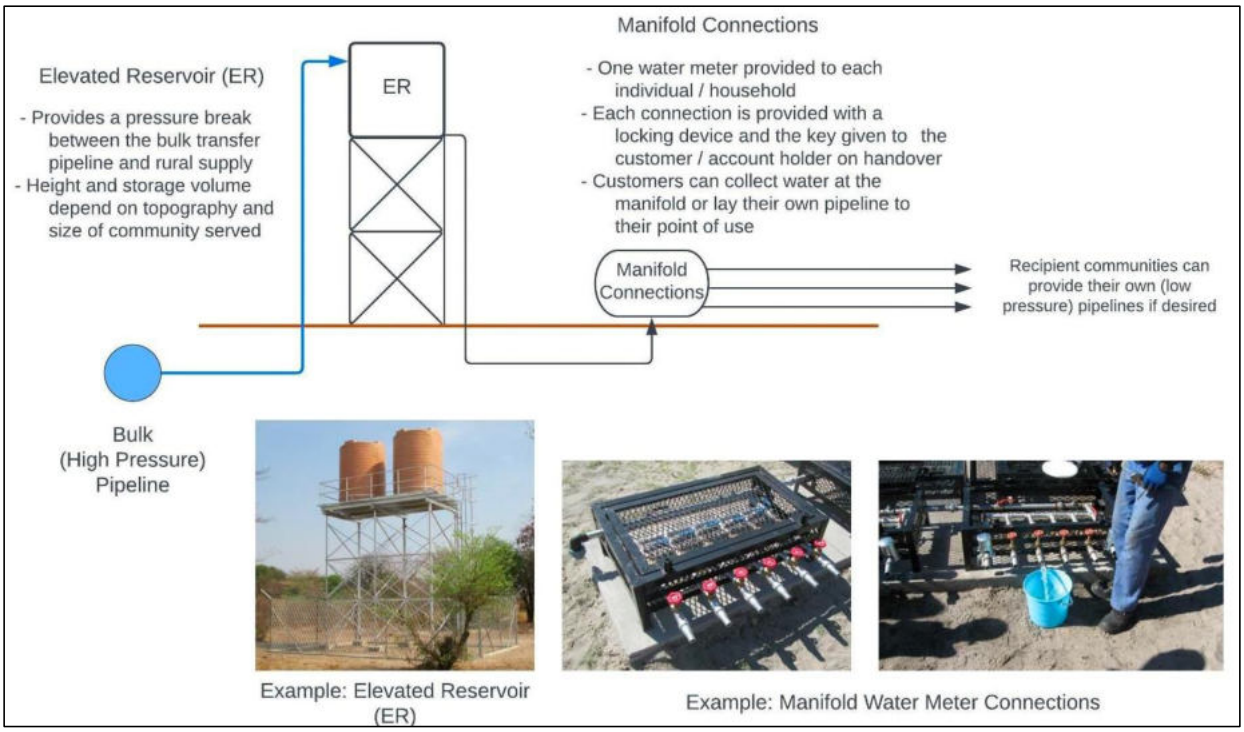

Figure 7: Schematic Representation of the Private Manifold Connections.

In terms of the design and operation of the scheme, the elevated reservoirs serve as a pressure break, with high(er) (pumped) pressures upstream of the reservoir than on the downstream side.

The pipework has been optimised by balancing life-cycle costs with capex, rendering an optimal network with flow velocities varying between 1.0m/s to 1.6m/s. The optimal pipe network comprises a combination of diameters from 200dia uPVC Class 9 to 75dia HDPE Class 10 as shown on the general layout in Figure 8

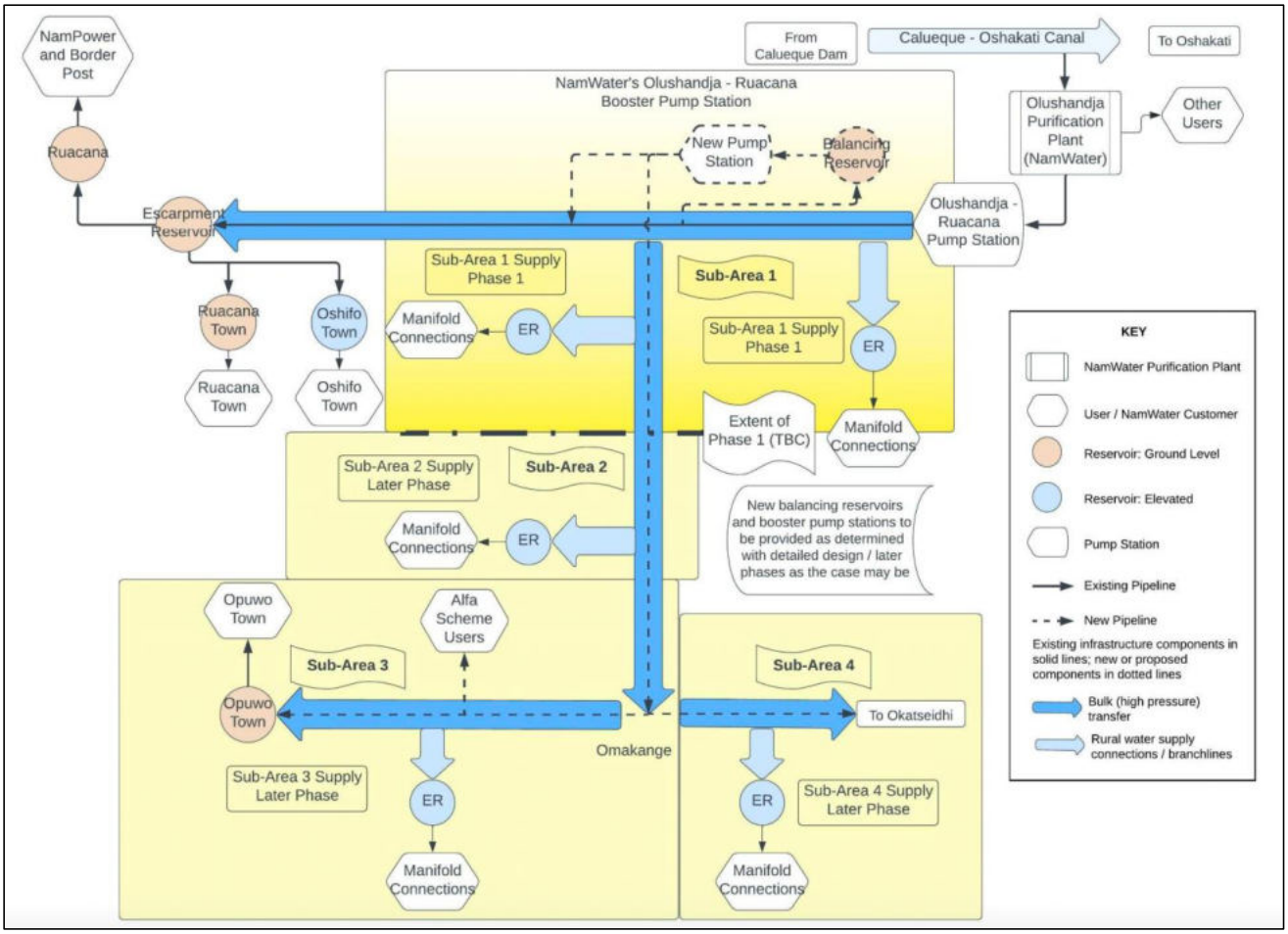

Figure 8: Schematic Representation of the Water Supply Concept for the RSWSP showing Phase 1 Sub-Area 1.

3.2.3. Pipelines (branch and rural pipelines)

The “branch pipelines” are deemed to be those which branch off the main or “bulk” Olushandja – Ruacana and Ruacana Booster – Engodo Pipelines which transfer water towards the rural communities. The details of branch and rural pipelines for Phase 1 are provided in

Table 2.

Table 2: Branch and Rural Pipelines: Total Current and Previous Requirements

Component	Required Design in 2015				Required for Current Design			
	Nominal Diameter (mm)	Pipe Class	Pipe Material	Length (m)	Nominal Diameter (mm)	Pipe Class	Pipe Material	Length (m)
Branch and Rural Pipelines	110	16	uPVC	2,655	Not now required			
	110	12	uPVC	10	Not now required			
	110	9	uPVC	1,740	110	9	uPVC	3,694
	110	6	uPVC	910	110	6	uPVC	2,596
	Not previously required				90	16	uPVC	2,474
	90	12	uPVC	1,347	Not now required			
	90	9	uPVC	8,818	90	9	uPVC	17,133
	90	6	uPVC	33,121	90	6	uPVC	19,598
	63	9	uPVC	1,582	63	9	uPVC	3,131
	63	6	uPVC	38,185	63	6	uPVC	35,882
	Total			**88,368**	**Total**			**84,508**

Design specifications of the proposed branch pipelines consist of the following:

1. The pipelines will be laid alongside existing tracks were available for each of construction, operation, repair and maintenance, as previously proposed and surveyed;
2. The pipelines will cross the tar roads where existing culverts are available, to limit the interaction with the road infrastructure, for which permission will be confirmed with the Roads Authority during detailed design;
3. The pipeline will be laid at depths as follows:
    a. Cover depth of 900 mm along main (tarred) roads and at constructed road crossings (if applicable);
    b. Cover depth of 600 mm along gravel roads, tracks and other locations;
4. Connections to the main pipelines will be housed in concrete and brick manholes and will consist of a tee-piece with thrust block against a concrete wall, isolating valves on the main pipeline and on the branch pipeline, air valves and appropriate fittings (flange adaptors, etc.). The manholes will be provided with a cover slab and circular manhole frame and lid with locking device. The manhole frame and lid will be of composite materials (DMC)22 in lieu of cast iron to prevent theft. Standard NamWater ID plates will be affixed to each cover slab, to indicate the chainage, pipe type and diameter at each installation;
5. Appurtenances are envisaged as follows:

a. Air valves, located at peaks / high points, breaks in slope and otherwise at intervals of between 500 m and 800 m. The profile of the branch pipelines will not be adjusted and will generally follow the ground profile for easier construction by rural communities and untrained labour. Double-acting air valves protected by steel cages bolted to concrete ground (ring) beams per the MAWLR / NamWater standard are proposed. Standard MAWLR ID plates will be affixed to each cage, to indicate the chainage, pipe type and diameter at each installation;

b. Isolating valves will be located at intervals of approximately 5 km to allow sections of the pipeline to be isolated during a pipe break or for other maintenance / repair work and to allow testing of the pipeline in shorter sections following construction. These isolating installations will consist of socketed resilient seal gate valves installed on the pipeline, with the valve body and spindle protected by a PVC sleeve

and a concrete marker block installed at ground level and around the sleeve pipe and housing a stopcock box Type 11a in the centre above the sleeve pipe. A Standard MAWLR ID plate will be affixed to each concrete block which is to be painted red, to indicate the chainage, pipe type and diameter at each installation;

c. Scour valves will be located in each pipeline section between isolating valves at appropriate low points to allow the pipeline to be drained if required. The installation of a scour tee on the pipeline, a riser pipe and above ground, a resilient seal gate valve and hand wheel protected by steel cages bolted to concrete ground beams per the MAWLR / NamWater standard are proposed. Standard MAWLR ID plates will be affixed to each cage, to indicate the chainage, pipe type and diameter at each installation;
d. Pipeline marker blocks consisting of yellow painted concrete pyramids placed on the pipeline at intervals of 500 m to 800 m, at Pipeline Intersection (PI) points (where the pipeline changes direction), and any off-take points are proposed;
e. Pipeline signboards showing the work “PIPELINE”, founded in concrete footings and located either side of road crossings are proposed.

4. PROJECT ALTERNATIVES CONSIDERED

Alternatives are defined as: "different means of meeting the general purpose and requirements of the activity" (Environmental Management Act (2007) of Namibia and its regulations (2012)). This chapter highlights the different ways in which the project can be undertaken and identify the alternative that will be the most practical but least damaging to the environment as well as in terms of technical and economic feasibility/suitability.

Introduction

Two broad project alternatives were considered. Alternative 1 entails upgrade of the existing pipeline including addition of new pipeline and related infrastructure in not serviced areas. Alternative 2 entails "No Go" alternative.

4.1. No-Go Alternative

The "No-Go" alternative is the option of not proceeding with the activity, which typically implies a continuation of the status quo. This would mean that the proposed upgrade and construction of water supply infrastructure in the area will not be carried. Should the proposed project be discontinued, none of the potential impacts (positive and negative) identified would occur. This would mean that the current inaccessibility to safe and clean water supply will persist and the communities in the project area will continue to face water scarcity issues. In considering the proposed project, the 'no-go' option cannot be a preferred alternative.

4.2. Upgrade of the existing pipeline

4.2.1. Design Alternatives

The detailed design for the proposed water supply infrastructures will take into consideration all raised environmental, social and technical options thereto. However, due to the project upgrades being done mainly along an existing infrastructure (local roads), i.e., activities taking place within an existing road reserve (for pipelines), it is unlikely that design alternatives will significantly change to potentially impact the environment.

4.2.2. Location Alternatives

Considerations for alternative sites for the positions of pump stations, pipelines and reservoir in the area are crucial for the project. The environmental, social and economic evaluation of these sites is performed according to the following criteria:

- Ecological Considerations: The main project activities that are likely impact ecological components are the pipeline routes. However, given the fact the longer distances of the pipelines will be within an existing road reserve and shorter distance from the main pipeline (for offtakes) will be less. Therefore, less ecological disturbance through vegetation clearing for instance, thus, potential negative impact on the ecological environment is minimized.
- Possible permits required: The permits to be obtained in terms of locality are mostly consent letters from directly affected landowners and local leadership (for communal land) where the pipelines pass through, if required by MEFT on the ECC application portal.
- Land use suitability: The land, particularly the topography (flat ground) is suitable for the project infrastructure establishment. If any pipeline(s) that may cross through private land (crop fields), and how

this should be negotiated between landowners and MAWLR before construction works start to ensure that there are no conflicts that impacts the project implementation.

- Communities and Stakeholders Consultation (Socio-economic): The stakeholders and communities indicated in the consultation meetings, the need to construct the water infrastructure in the consulted/targeted areas so that the communities have access to clean and safe water. The communities also emphasized the employment of locals during construction to benefit through income earned from the work.
- Cost-Benefit analysis: A cost-benefit analysis for the project was done by the Design Engineer, and it was deemed feasible.

The site selection process for the proposed project activities have identified optimum locations and routes. These are based on a screening criteria focusing on lowering the potential impacts from the project activities. Thus, the project development (construction and operation) is expected to induce lower impacts on fauna, flora, birds, local fishing, local tourism, archaeological aspects, and near habitation. Site specific alternatives assessment have been considered in this ESIA and will be audited against during implementation on compliance to the project ESMP.

4.2.3. Service and Infrastructure Alternatives

In terms of the resources that may be required for the proposed water supply construction (upgrading works), their alternatives are presented in Table 3 below.

Table 3: Alternatives considered in terms of services infrastructure for the project for the Construction phase.

Services	Proposed source	Alternative source
Water	• Water to be sourced from the nearest water supply source. • Water from the local existing boreholes.	For construction, a small volume of water will be required for the actual construction works. However, water will be required for domestic use by the workers. Therefore, the contractor will source the required water from the nearest water supply in the Region (upon reaching agreement with the supplier).
Power	• Electric drives and generators. • Electricity grid (powerlines) and or Solar	• For construction, diesel powered generators will be used. • For operations, where there is a nearby powerline, the water infrastructure will be connected to the grid. Where impossible, solar (photovoltaic (PV) will be utilized.
Power for cooking	• Gas stoves • Firewood	• Gas stove (paraffin cookers) to avoid
Worker's accommodation	• Setting up campsites tented campsite at selected sites along the project route.	This will depend on where along the work is taking place. Set up temporary camps onsite (instead of commuting to and from towns or settlements. The

Services	Proposed source	Alternative source
	• Commuting from Outapi or Ruacana Town	travelling time needed to and from working sites, would affect the work productivity. Therefore, onsite camp would be feasible. An agreement to set up camp will be made with the Traditional Authority.
Waste Management for construction and maintenance		
Sewage	• Install fixed facility with septic tank. • Portable facilities with septic tank.	Portable toilets – these are easily transportable and have no direct impact on the environment or ecology (if waste is properly disposed of). In other words, to minimize rehabilitation costs portable facilities were selected as the best option.
Domestic waste	• Onsite waste bins, regularly emptied at the nearest waste management site. • Create a project dumpsite onsite.	Storing waste in waste bins onsite and upon reaching capacity, transport it to the nearest town waste site such as Outapi or nearest settlement council with an approved solid waste management site.
Hazardous waste (chemicals)	Waste generated is to be transported to and disposed of at an appropriate facility in the nearest town equipped for the disposal of hazardous waste.	None

The above presented project activities and alternatives provided above are governed by both local (institutional), regional and national as well as international legal requirements. Therefore, legal framework pertaining or applicable to this project and its activities are presented under the next chapter.

4.3. Conclusion

Alternative one (no go) is clearly not recommended given challenges associated with lack of access to reliable potable water in the project area (health challenges, gender issues, socio-economic challenges). Alternative two for the upgrade of the existing pipeline to serve more people is supported by the proponent.

Therefore **Alternative 1** was the recommended alternative for the reasons stated above. All relevant specialist studies needed for the environmental and assessment of Alternative two were assessed since most of the work will be upgrading the existing infrastructure with less opening of the new areas, and only existing roads and the existing servitude will be utilized for the transport construction vehicles, machinery and materials. The Environmental Scoping Study Report, together with an Environmental Management Plan which have been revised to form the Full ESIA acceptable to the lender, have therefore been submitted to Ministry of Environment and Tourism – Department of Environmental Assessment (MET-DEA) to obtain an Environmental Clearance and to the African Development Bank for clearance and disclosure based on the assumption that Alternative two will be implemented.

5. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The Government of Namibia has enacted a number of laws, regulations, policies for environmental and social impacts management of infrastructure projects ensuring sustainable development, conservation and to limit overexploitation of resources. A review of relevant Namibian legislation, policies and guidelines applicable to the proposed development was done and the summary of the review is presented in Table 4. These informs the Proponent, I&APs and the decision-makers at the DEA the requirements and expectations, as laid out in terms of these instruments, to be fulfilled in order to undertake the water infrastructure upgrade activities.

5.1. National Legal Compliance

The implementation of RSWSP Phase 1 triggers the following Namibia legislations, policies and legal framework:

- Constitution of Namibia (1990)
- Environmental Assessment Policy of Namibia 1994
- Environmental Management Act No. 7 of 2007
- Environmental Assessment Regulations of 2012
- The Water Act 54 of 1956
- Water Policy for Namibia (2000)
- Water Supply and Sanitation Policy (WSASP) of 2008
- Integrated Water Resources Management Plan (2010)
- Water Resources Management Act No.11 of 2013
- Pollution Control and Waste Management Bill
- Atmospheric Pollution Prevention Ordinance 11 of 1976
- National Solid Waste Management Strategy
- Soil Conservation Act 76 of 1969
- Forest Act 12 of 2001
- National Policy on Climate Change for Namibia (2011)
- National Climate Change Strategy & Action Plan 2013 – 2020
- Nature Conservation Ordinance (1996)
- Namibia's Second National Biodiversity Strategy and Action Plan 2013 – 2022
- The Labour Act 11 of 2007
- The National Health Act 2 of 2015
- The National Heritage Act 27 of 2004
- The Health and Safety Regulations GN 156/1997 (Government Gazette 1617)
- The Public Health Act 36 of 1919
- Public and Environmental Health Act No. 1 of 2015
- National Gender Policy 2010 – 2020
- National Resettlement Policy.

The above-listed legal requirements (national legislations and policies and their inclusion in the proposed project assessment) are presented in Table 4.

Table 4: The national laws, policies, legal and administrative regulations pertaining to the project activities.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
The Constitution	Namibian Constitution First Amendment Act 34 of 1998.	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the Sustainable objectives which include: - Guarding against overutilization of biological natural resources, limiting over-exploitation of non-renewable resources, ensuring ecosystem functionality, and maintain biological diversity.	Ecological sustainability concepts within the constitution should guide all projects. Protect the environment and ensure citizens enjoy their right to a safe environment.
Recent Development Plans	Namibia's 5th National Development Plan (NDP) (2017/2018-2021/2022)	The NDP5 indicates that by 2022, Namibia has a sustainable production and consumption of water resources resulting in improved access to safe drinking water for human consumption and for industry use. Each rural constituency will have water access of above 50%.	The project is aimed at contributing to the NDP5 by upgrading existing water infrastructures, construct new water supply infrastructure, improve the management of existing water sources, enhance transboundary cooperation
Climate Change	National Policy on Climate Change for Namibia (2011)	The National Policy on Climate Change supports constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation." The goal of the National Policy on Climate Change is to contribute to the attainment of sustainable development in line with Namibia's Vision 2030 through strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	The project by virtue of providing safe reliable access to potable, it enhances and improve the welfare of the people of Namibia, particularly those living in remote and marginalised communities thus addressing the water scarcity caused by climate change impacts. Through the implementation of the project that offer water supply solutions, the program project contributes towards sustainable development. The project, directly and indirectly, reduces the climate risk for several communities through provision of reliable, safe water to the people of Namibia. The project implementation is aimed at addressing climate change mitigation and adaptation. The implementation should be climate sensitive.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		The policy reckons that Namibia has limited capacity to adapt to climate change impacts. The policy projected that Namibia would become drier with more variability in rainfall and developed strategies and action plan to cope with adverse climate change impacts, (Namibia, 2010).	By implementing the project, MAWLR is promoting the provision of basic services of safe, clean and reliable water supply.
	National Climate Change Strategy & Action Plan 2013 - 2020	The Strategy outlines Namibia's response to climate change. The strategy aims to address and plan for action against climate change, both through mitigation and adaptation actions. In its adaptation strategy, the Strategy recognises the role of a sustainable water resource base.	The project implementation should adopt measures that strengthen sustainable water resource base development of the country. The implementation should be very careful on not to cause harm to ensure sustainable use of the available water resources but and improve the management through various conservation technics.
Environmental management	Environmental Management Act, (Act No. 7 of 2007)	The Act gives general principles for the management of the environment and natural resources. Requires that projects with significant environmental impact are subjected to an environmental assessment process (Section 27). According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister Requires for adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions about a project (Section 2(b-c)).	The EMA and its regulations should inform and guide this EIA / ESIA process of. An ECC should be obtained for the project If granted, the ECC should be renewed every three years, subject to compliance audits.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
	EIA Regulations Government Notice (GN) 57/2007 (Government Gazette (GG) 3812	Details principles which guide the EIA process. Details requirements for public consultation within a given environmental assessment process (GN No 30 Section 21). Section 3 (2) (e) states that "assessments must be undertaken for activities which may have a significant effect on the environment or the use of natural resources". Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15).	
Vegetation	Annotated Statutes Forest Act 12 of 2001 Forestry Act 13 of 2005 & Forestry Regulations (GN 170 of 2015.	Section 10 (1) set out the aims of the forest management as to which forest resources are managed and developed, including the planting of trees where necessary, in Namibia is to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment. Section 22. (1) (Protection of Natural vegetation) Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - Republic of Namibia 20. (a) vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or	The clearing of vegetation is prohibited (subject to a permit for protected plant species). Certain (protected) tree species occurring in the area are protected under this Act and require a permit from the Directorate of Forestry for removal. The construction of waterworks infrastructure (bulk water supply) such as pipelines and conveyance systems may trigger the removal of vegetation. The constructions of the bulk water infrastructure projects especially at abstraction points on surface water resources can potentially trigger the removal of living trees, bushes and shrubs growing within 100m of a river, stream or watercourse. The removal of trees in the above instances would require the project contractors or sub-contractors to acquire necessary permits first. Protected tree and plant species as per the Forest Act No 12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		(b) any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse. (2) A person who wishes to obtain a licence to cut and remove the vegetation referred to in subsection (1) shall, in the prescribed form and manner, apply for the licence to a licensing officer who has been designated or appointed for the area where the protected area is situated.	
	Nature Conservation Ordinance (1996)	This ordinance relates to the conservation of nature; the establishment of game, parks and nature reserves; the control of problem animals; and highlights matters incidental thereto.	The activities of the project are highly localized but there are certain areas where the project passes through the Kavango-Omusati Trans frontier Conservation Area. Therefore, there is a potential to interfere with parks, games, and nature reserves. However, there is need for proper designing and planning of the water supply network of the project to make sure that the infrastructure will not interfere with facilities listed in the Nature Conservation Ordinance.
Occupational Health and Safety	Labour Act 11 of 2007. Health and Safety Regulations GN 156/1997 (GG 1617)	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47). Details various requirements regarding health and safety of labourers. Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	All contractors involved in the construction of the services infrastructure for this project are required to comply with this Act and its regulations. The construction and operation activities will invite significant amount of laborious work. Therefore, there is need to make sure that the workers participate are protected and that they are from the local’s especially unskilled labour. Potential nuisances (e.g. dust generation) should be considered during the construction phase and avoided.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
Community and Environmental Health and Safety	Public Health Act (No. 36 of 1919)	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent, their contractors (subcontractors) and all its employees should ensure compliance with the provisions of these legal instruments during the construction as well as operational and maintenance phases. The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that is safe, or not injurious or dangerous to public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels Provision of community labour, the input of the local communities is usually in the form of labour for the excavation, backfill and compaction of the pipeline trenches. These activities are usually associated with health and safety risks owing to mishandling of equipment and materials, as well as poor storage of hazardous materials onsite.
	Public and Environmental Health Act No. 1 of 2015	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	
Gender	National Gender Policy 2010 - 2020	The Policy seeks to create an enabling environment for sectors to mainstream gender in line with National Development Plans (NDPs). It identifies who will be responsible for the implementation of the policy and who will be accountable for gender equality results.	The project implementation should make sure that both women and men are included in equal proportions including their water needs and priorities. Since women play central role in the collection of water in Namibia, their input is crucial should not be undermined. The project implementation should mainstream gender including the assigning of roles and participation of both women and men at various development phases of implementation.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
Waste management	National Solid Waste Management Strategy	The Strategy ensures that the future directions, regulations, funding and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders The Strategy listed priorities for the strategy to address for effective solid waste management, the priorities given below are the most relevant to the project. Waste disposal is the main problem with the current solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	The water infrastructure upgrade can potentially generate significant amount of solid waste that might need proper management by contractors to avoid pollution. Waste management plans should be generated and implemented prior the commencement of civil works and during operation of the project infrastructures. Contractors for the construction of the water infrastructures should reduce the risk of solid waste to the environment and surroundings of the project area.
	Pollution Control and Waste Management Bill	The bill aims to “prevent and regulate the discharge of pollutants to the air, water and land” Of particular reference to the Project is: Section 21 “(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse.” Section 55 “(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment.”	The project activities trigger section 21 and 22 of the bill, this so because activities like the activities associated with the construction of water infrastructures, installation of pumps can potentially directly pollute the water sources, if not properly handled. Contractors and subcontractors of the civil works of the projects should make it mandatory that they manage their waste in a manner that do not cause environmental threat and risk both to the surroundings and the local communities.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
	Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	If the contractor intends to keep hydrocarbon (fuels) onsite in the quantity of 600 litres or more, they should obtain the necessary authorisation (consumer installation certificate) from the Ministry of Mines and Energy for the storage of fuel on-site.
	Hazardous Substance Ordinance, No. 14 of 1974	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment.
Water	Water Act 54 of 1956	- The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: - Prohibits the pollution of underground and surface water bodies (S23 (1)). - Liability of clean-up costs after closure/ abandonment of an activity (S23 (2)). - Protection from surface and underground water pollution	The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction.
	The Water Resources Management Act No. 11 of 2013	The aim of the Act is to provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters. Section 3 of the Act recognises the fundamental principles in Water Resources Management in Namibia:	The protection (both quality and quantity/abstraction) of water resources should be a priority. Relevant permits and or agreements to abstract and use water should be applied for and obtained from the Ministry of Agriculture, Water and Land Reform's Directorate of Water Resources Management (Water Law Policy Administration Division)

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		Equitable access for all people to safe drinking water is an essential basic human right to support a healthy productive life. Access by all people to a sufficient quantity of safe water within a reasonable distance from their place of abode to maintain life and productive activities; Promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues; Development of the most cost-effective solutions, including conservation measures, to infrastructure for the provision of water; Supporting integrated water resources management through human resources development and capacity building; Promotion of water awareness and the participation of persons having interest in the decision-making process should form an integral part of any water resource development initiative.	
	The Water Policy of Namibia, (2000)	The Policy established that the development and management of water services in Namibia have focused on building and running supply delivery systems to meet water needs of various users. These structures and systems include – at the sophisticated end of the scale – large dams, canals, major pipelines, pumping stations, and water treatment works. The Policy listed 12 principles of water management in Namibia among to support Water Resources Management Act No. 11 of 2013: Equity (right to water for all Namibians),	The project should aim to fulfil the requirements and goals of the Policy through the construction and upgrading of the planned pipelines works and reservoirs in the project area.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		Promotion of development (water resources should be utilized, developed and managed in such a way as to promote equitable and sustainable socio – economic development), Economic value (scarce water in Namibia should be utilised and recognised as an economic value), Awareness and participation (fostering participation of different water stakeholders), Openness and transparency. Decentralisation (The operational management of water resources and water services shall be decentralised to the lowest practicable level), Ecosystem values and sustainability, Integrated management and planning, Clarity of institutional roles and accountability, and Capacity building.	
	Water Supply and Sanitation Policy (WSASP) of 2008	The policy has strong focus on Water Demand Management (WDM). The policy was formulated with four long term components: - Water supply and sanitation services should become available to all Namibians; Equitable improvement of water and sanitation services should be achieved by the combined efforts of the government and the beneficiaries, based on community involvement and participation, the acceptance of a mutual responsibility and by outsourcing services where necessary and appropriate, under the control and supervision of government. Communities should have the right, with due regard for environmental needs and the resources and information available, to determine which water and sanitation solutions and	It is relevant as it puts emphasis on the improvement of water supply services should be a combined effort of the government and the beneficiaries, based on community involvement, participation and responsibility, it is thus imperative to determine which solutions and service levels are acceptable to them, and they shall contribute towards the cost of services.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		service levels are acceptable to them within the boundaries of the national guidelines. The policy formulated to improve the provision of water supply to: - Contribute to improved public health; - Reduce the burden of collecting water; - Promote community based social development taking the role of women - into special account; - Support basic water needs; - Stimulate economic development; and - Promote water conservation The policy has two water supply priorities: (1) This is the provision of water for domestic use, and. (2) This is the provision of water for economic activities.	
	The Integrated Water Resource Management Plan (2010)	The Plan promotes coordinated management and utilisation of water, land and related services in Namibia to realise social, environmental and economic growth. The overall long-term goal of IWRM in Namibia is to achieve a sustainable water resources management regime contributing to social equity, economic efficiency and environmental sustainability.	The implementation of the project is line with the goal of the IWRM Plan of Namibia because the program would ensure there is social equity and economic efficiency of water management.
Soil	Soil Conservation Act 76 of 1969	The Act established to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources in the Republic of Namibia. The Act give powers to the Minister in section 3 (d) the powers to gazette activities that relate to the run-off or drainage of rainwater, the withdrawal from cultivation, the protection and stabilizing of	Duty of care must be applied to soil conservation and management measures must be implemented during the construction and maintenance stages of the project.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		natural water courses and the establishment, maintenance and protection of artificial water courses	
Air Quality	Atmospheric Pollution Prevention Ordinance (1976	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	The proposed project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented.
Heritage	National Heritage Act 27 of 2004	Section 48(1) states that "A person may apply to the (Heritage) Council for a permit to carry out works or activities in relation to a protected place or protected object" Protects and conserves cultural heritage and cultural resources with special emphasis on places and sources of National heritage including graves, artefacts and any objects older than 50 years.	The construction of long pipelines has a potential to pass through heritage sites, graveyards. Any heritage resources (e.g. human remains etc.) discovered during excavations would require a permit from the National Heritage Council of Namibia for relocation. Detailed designing of the pipe routes, locations of installation of pumps and tanks should avoid the heritage sites, when it's not possible, necessary arrangements with right stakeholders should lead the process. A Chance Finds Procedure provided should be implemented upon discovery of archaeological and heritage resources.
Land	Communal Land Reform Act 5 of 2002	The law states who owns communal land, how the land is given to people by whose authority. The Act regulates the registry of customary land rights and certificate of registration of customary land right. Wherever, there is potential to interfere with the communal land. Right procedures should be followed. The Act	The bulk water supply projects may interfere with communal landowners (such as pipelines passing through crops fields where there is no suitable diversion), this may arise disputes, especially in a case where pipelines are passing through areas where communities are not beneficiaries. Contractors should

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
		give Chiefs or Traditional Authority the power to allocate a customary land right under section 22 of the Act.	always approach chiefs or traditional authorities wherever there is potential to interfere with communal land and disputes.
	The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are I&APs and must be consulted during the ESIA and implementation of the project. The project site falls under the Omusati Regional Council; therefore, they should be consulted and engaged throughout the construction throughout to the operational phase of the project.
	National Resettlement Policy	The primary objective of the Policy is to focus on resettlement of eligible person in ways which are institutionally, sociologically economically and environmentally sustainable and allow beneficiaries to become self-supporting. The Policy reckons that resettlement should not only mean providing people with land, housing, infrastructure, knowledge and skills to maintain and develop new environment, but it also means establishing innovative attitude.	There are project activities and projects that can potentially cause resettlement of communities that will only become evident after detailed and specific designs of the infrastructure like pipeline routes (on activities that require opening of new land). There is no anticipated relocation or resettlement of communities, however, there is a potential of water infrastructures such as pipelines passing through community crop fields. Wherever resettlement happens during the implementation of various activities, the victims (affected parties) should receive training related to the improvement of their innovative attitude and their self-supporting.

Theme/Aspect	Legislation	Relevance Provisions	Project Implications
	Traditional Authority Act (Act No. 25 of 2000)	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leadership, the Chiefs, to exercise control on behalf of the state and the residents in their designated area.	The project routes fall under the local Traditional Authorities of the project area. Therefore, they should be consulted and updated throughout the project implementation through local representatives such as headmen and or secretaries/chairpersons. Where needed, especially by MEFT for the evaluation of the ESIA/Scoping report, a land use consent should be obtained.
Roads	Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	The pipelines mainly follow the road or fall within the road reserves. Therefore, Roads Authority of Namibia should be engaged throughout the project cycle. If need be, the relevant permits must be applied for.
	Roads Ordinance No 17 of 1972	- The Ordinance consolidates the laws relating to roads. - Section 3.1 deals with width of proclaimed roads and road reserve boundaries. - Section 27.1 is concerned with the control of traffic on urban trunk and main roads. - Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads. - Section 37.1 deals with infringements and obstructions on and interference with proclaimed roads.	The proposed water infrastructure upgrades must adhere to all applicable provisions in the Roads Ordinance.

5.2. AfDB Legal and Policy Framework

As the funding agency, AfDB requires that the project to comply to its ESS in addition to the national legislative described above. This is how AfDB ensures that its resources and financial support is limiting the environmental and social impact (negative) while strengthening the positive impacts opportunities. These ESS are briefly explained below.

5.2.1. AfDB Operation Safeguards (OS)

The AfDB as the lending institution has specific requirements that borrowers should satisfy regarding protection of the environment, indigenous and local people/communities against exclusion and marginalisation caused by economic development activities funded by the bank. The five AfDB OS are given below:

- Environmental and social assessment
- Involuntary resettlement land acquisition, population displacement and compensation
- Biodiversity and ecosystem services
- Pollution prevention and control, hazardous materials and resource efficiency
- Labour conditions, health and safety

The checklist of the operation safeguards against the project activities is provided in

Table 5 below.

Table 5: The applicability of the AfDB OS to the project activities.

Operational Safeguard	Applicability / Implication to the Project
Environmental and social assessment	The nature of the activities trigger both environmental and social impacts; negative and positive. Activities like construction of bulk water infrastructure (pipelines, installation elevated water reservoirs, trenching, excavations, and contractor's construction vehicle movements) potential causes environmental impacts to the receiving communities hence require assessments prior the implementation. The provision of safe reliable water will improve the social wellbeing and livelihoods of communities in Omusati Region (various constituencies and villages). The project creates jobs to the local communities hence improve the socio-economic status of the communities.
Involuntary resettlement land acquisition, population displacement and compensation	The project activities like pipeline installation can potentially causes involuntary resettlement, acquisition of land, population displacement and compensation.
Biodiversity and ecosystem services	The project implementation should ensure that all the natural resources are conserved and sustainably used to allow future use of the resources and development. Concepts of sustainable development should lead the process.
Pollution prevention and control, hazardous materials and resource efficiency	The project activities such as construction of bulk water infrastructure (pipelines, installation elevated water reservoirs, trenching, excavations, and contractor's construction vehicle movements) potential generate solid waste that can pollute the environment. Proper planning of waste through waste management plan should be provided to/by contractors' prior civil works.
Labour conditions, health and safety	The construction and installation of bulk water infrastructure require enormous labour which majority of it particularly the unskilled labour should be provided by

Operational Safeguard	Applicability / Implication to the Project
	locals. These are people with no training hence proper human management and monitoring is need to avoid accidents at work, ensuring good labour conditions is also critical. Some of them would be woman and other vulnerable groups.

5.2.2. AfDB Safeguard Policies

Other than the OS, the Bank's has Safeguard Policies (SP), where the Integrated Safeguards System (ISS) derived. The project activities triggers these safeguard policies. The safeguard policies includes:

- Involuntary resettlement (2003)
- Environment (2004)
- The Gender (2001)
- The Climate Risk Management and Adaptation Strategy (2009)
- Health (1996)
- Integrated Water Resources Management (2000)
- Agriculture and Rural Development (2000, 2010)
- Poverty Reduction (2004)

5.3. Applicable International Legal Requirements

In addition to the Namibian legal requirements detailed above and the AfDB Standards, compliance with various International Standards and guidelines would be required during the implementation and operation of the project but not mandatory. This however, allows acceptability of the program at global level. The international legislations and guidelines are described below.

5.3.1. International Finance Corporation (IFC) Performance Standards

The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment.

Given the fact that the proposed project is funded by international investors and the financing require the project to comply with certain requirements, particularly the International Finance Corporation (IFC) Performance Standards (PSs). Therefore, it is crucial to analyze the ESIA Study process against these IFC's PSs and these are listed in Table 6.

Table 6: The applicability of the IFC Performance Standards (PSs) to the project activities' ESIA Study.

IFC PS	Relevant Provisions of the IFC PS	Implications for the project / Actions Taken
PS1	Assessment and Management of Environmental and Social Risks and Impacts:	The ESIA has been undertaken in accordance with this PS, whereby the project has been advertised in the national media outlets, consultation meetings held and feedback/ comments incorporation into the Report and ESMP together with identified potential adverse/negative and positive environmental and social impacts from the project.
PS2	Labour and Working Conditions	The ESIA Study assessed the potential impacts of the project activities on the project crew's health and safety in accordance with the Labour Act (No. 6 of 1992) and fair labour working conditions, including compensations, i.e., no compromising of the labour and working welfare of workers as required in the ESMP.
PS3	Resource Efficient and Pollution Prevention and Management	The ESIA Study assessed the usage of resources such as water, soils and power resources required for the project during the duration of construction works. The appropriate measures to manage and mitigate the impacts associated with the project activities have been provided in the ESMP for implementation.
PS4	Community Health and Safety	The potential impacts of the project activities on the construction crew as well as communities' health and safety in accordance with the Labour Act (No. 6 of 1992) have been assessed and mitigation measures provided accordingly, i.e., ensuring that the construction and operation activities do not compromise the safety and welfare of workers and communities.
PS5	Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	The project area falls on communal land. Therefore, a consent letter is issued by the area Traditional Authority which is submitted to the MEFT alongside the Scoping Report. There is a potential involuntary relocation or displacement of properties such as crop field fences or pipelines passing through people's crop fields. Therefore, PS5 is applicable to the project during construction.
PS6	Biodiversity Conservation and Sustainable Management of Living Natural Resource	The ESIA Study undertook a baseline assessment of the fauna and flora in the project area.
PS7	Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities	The project falls within a communal land and according to the information provided in the consultation meetings, there is no presence of indigenous people within or along the project route.

IFC PS	Relevant Provisions of the IFC PS	Implications for the project / Actions Taken
PS8	Cultural Heritage	An Archaeological & Cultural Heritage Impact Assessment (AHIA) has been undertaken for the ESIA Study by TARO Archaeological & Heritage Consultants (TARO Consultants). The baseline, impact assessment and mitigation measures have been done and compiled by TARO Consultants. The AHIA Report has been compiled in accordance with the Guidelines of the National Heritage Council of Namibia (National Heritage Act No. 27 of 2004 and The National Monuments Act (No. 28 of 1969)).

5.3.2. Other Applicable Regional and International Statues and Conventions

The applicable regional and international statues such as policies, standards and conventions that may govern the project activities are provided under Table 7 below.

Table 7: Other international treaties and conventions governing the proposed project activities.

Statue	Relevant Provisions	Implications for the project
Protocol on Shared Watercourses in the SADC	The overall objective of the Protocol is to foster closer cooperation for judicious, sustainable and coordinated management, protection and utilisation of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation.	Relevance and implication to NWSSP: This projects will be using shared water courses as their water supply sources particularly the Kunene River. Therefore, there is need to comply with the protocol needs.
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.	These principles are an attempt to: '…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.	The project activities should not be undertaken such that they contribute to desertification in the project area.

Statue	Relevant Provisions	Implications for the project
	The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention.	
The UN Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	The project activities excavations and civil works of bulk water infrastructure should conserve biodiversity, the removal of vegetation cover and destruction of natural habitats should be avoided and where not possible it should minimised
United Nations Framework Convention on Climate Change (UNFCCC) in 1995	In 1995 Namibia ratified the UNFCCC; an international environmental treaty. The ultimate objective of the Convention is to "stabilise greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system."	This applies to climate change component, the convention calls for intervention in reduction of greenhouse gases; the project activities should reduce the emission of greenhouse.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	The project implementation should ensure protection of natural resources and prevention of any form of pollution wherever possible.
International Union for Conservation of Nature (IUCN)	The Union provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together. The mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.	MAWLR should ensure that conservation of nature is prioritized in the areas of their operations.

Statue	Relevant Provisions	Implications for the project
African convention on conservation of nature and natural resources	This Convention focuses on living resources, calling for the creation of protected areas and for the specific conservation measures for listed species. It also provides the grounds for the conservation of other natural resources such as soil and water, for the consideration of environmental concerns in development plans, and for research and education.	The project activities will have a direct impact on the natural resources by clearing of vegetation, loosening soils during trenching activities. Thus the requirements of this convention have to be considered in the implementation of the project.

5.3.3. Permitting requirements

Below are the environmental and social permitting and approvals required before or during the project development (Table 8). These include national requirements and international requirements. Some of them have been in other sections of this report while some may be applied during different stages of the project implementation.

Table 8: The environmental and social permitting and approvals (national and AfDB) required for this project.

Category	Name	Stage of project development	Explanation
National	EIA/EMP	Before the project start	Providing the corrective management and measures to manage environmental impacts associated with project activities.
	Vegetation permit	During the project development.	To avoid unnecessary of harvesting or destruction of protected vegetation species. This is required if protected vegetation by Namibia laws is found in the project area and is required to be uprooted or is disturbed. See Flora and Fauna Specialist report (Appendix A) of this report.
AfDB	ESIA	Prior the project development	Identifies and assess the E&S risks and impacts of a proposed project, set of activities or other initiatives, evaluate alternatives, and design appropriate mitigation, management, and monitoring measures.

6. ENVIRONMENTAL AND SOCIAL BASELINE

The proposed project will be undertaken in a specific biophysical and social environment. The baseline conditions of these environmental features are described in sections below. The baseline conditions are described for the area/regions through which the project activities will be carried out.

6.1. Physical Features

The physical characteristics of the Omusati Region and Project Area are as follows:

6.1.1. Climate

The project area and Namibia are classified as Group B of the Köppen-Geiger Climate Classification, which contains dry, arid and semi-arid climates, characterised by actual precipitation being less than a threshold value set equal to the potential evapotranspiration. The project area straddles the boundary between the warm desert climate (BWh) to the west and the warm semi-arid climate (Bsh) to the east, which is the climate which describes the central and northern parts of Namibia. The generally warm (hot) and arid climate areas describe areas which lose more water via evapotranspiration than falls in precipitation.

Rainfall across the northern parts of Namibia, including the Project Area, varies greatly in amount and timing. Almost all the rain falls during the summer months, when temperatures are highest, roughly between October and April. The eastern areas generally receive higher and more reliable rainfall than the western areas. Average rainfall varies from about 350 – 400 mm per annum in the east to about 300 – 350 mm per annum in the west and north-west of the Project Area (see Figure 9). Water which enters the Project Area, either as rainfall or flowing surface water in the Cuvelai system, rapidly evaporates or seeps into the sandy ground. Most of the rain-carrying air blows in from the north-east and north, providing these areas with rain at the beginning of each rainy season, leaving less moisture to fall further south and west of the region. The hills in the vicinity of Tsumeb forces the incoming air upwards where it cools, condensing the water vapour resulting in higher rain falls in that area.

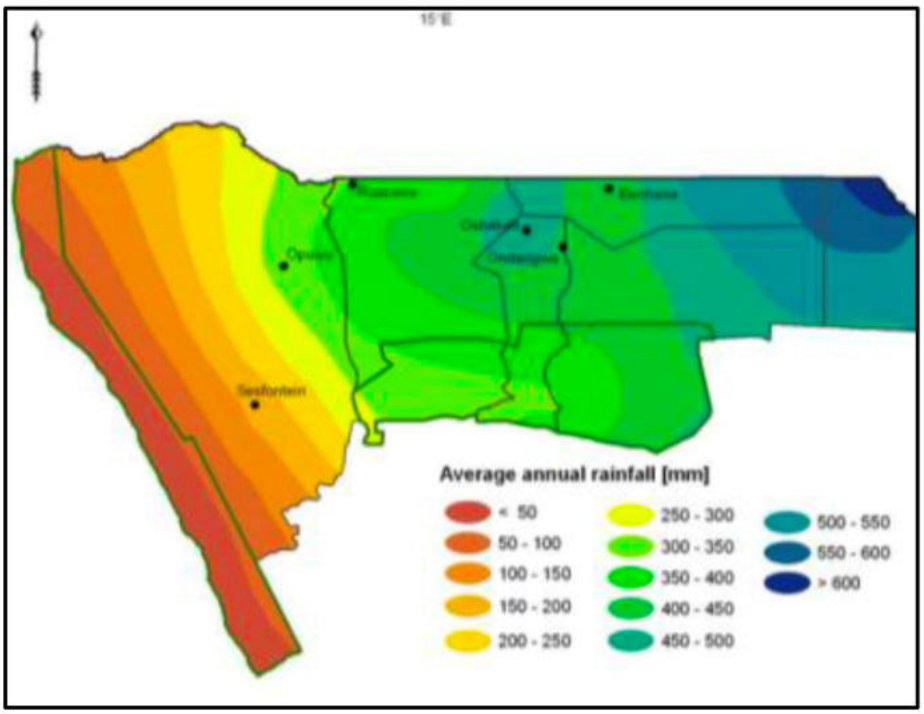

Figure 9: Average Rainfall in Across the Project Area. Source: GOPA, 2014[10].

Average daily temperatures rise from about 17º Celsius in June and July to about 25º Celsius in October, November and December. These three months and September also have the highest maximum temperatures for the year of between 30º and 35º Celsius. The summer months that follow are generally cooler due to the effects of cooling rain and greater cloud cover. Average minimum winter temperatures drop to about 7º and 8º Celsius[11,12]. The coldest month in winter is July, but most of the area never experiences frost. Mean monthly values of humidity range from about 50%-80% in March, which is the most humid month in the Cuvelai, to less than 20% in September, which is the least humid month[13]. At Opuwo, relative humidity is 32% in September and 82% in March.

Wind direction is highly variable and there is no prevailing wind direction across the Cuvelai Area, although an easterly component is slightly more frequent than from any other direction. Wind speeds are generally lowest at night and early mornings, reaching a maximum around 14h00 in the afternoons.

Temperature, humidity, wind and vegetation cover all influence evaporation rates. Approximately 2,500 millimetres of water evaporates from the surface of the Project Area each year[14]. With an average annual

[10] GOPA, 2014: "*Community-Based Rangeland and Livestock Management Project: Water Infrastructure Provided in Rangeland Intervention Areas*", report to the Millennium Challenge Account Namibia under the Community Based Rangeland and Livestock Management Project, by GOPA Consultants (GOPA), Oshakati, March 2014.
[11] Mendelsohn et al., 2022: Atlas of Namibia: A Portrait of the Land and its People (updated version). Cape Town: David Philip Publishers.
[12] Mendelsohn et al., 2022: Atlas of Namibia: A Portrait of the Land and its People (updated version). Cape Town: David Philip Publishers.
[13] Mendelsohn et al., 2000: "A profile of North – Central Namibia", J. Mendelsohn, S. el Obeid and C. Roberts, ISBN 99916-0-215-1, produced by Environmental Profiles Project, Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek, Gamsberg Macmillan, 2000.
[14] LCE, 2022: Ruacana Water Supply project: Preliminary (concept) Design Memorandum. A report submitted to Ministry of Agriculture, Water and Land Reform.

rainfall of between 300 – 400 millimetres, this means that considerably more water (about seven times more) evaporates than falls each year. It is this difference between low rainfall and high evaporation rates that causes the arid conditions in the Project Area. Evaporation rates are highest between September / October and December / January because of the heat and the stronger winds that prevail in this period, as well as lower levels of cloud cover. High evaporation rates mean that water dries up soon after the rainy season. As the water in the *iishana* evaporates, the salinity increases, and the nutritional value of the water decreases.

Mean monthly values of humidity range from about 50%-80% in March, which is the most humid month in the Cuvelai, to less than 20% in September, which is the least humid month[15]. At Opuwo, relative humidity is 32% in September and 82% in March.

6.1.2. Geology

The Cuvelai Area is situated in the intra-continental Owambo Basin, which was formed during the post-cretaceous tectonic development of southern Africa (see Figure 10). A sedimentary rock cover of up to 8,000 m thick was deposited in the late Precambrian Age on top of the mid- Proterozoic crystalline basement (Congo Craton). During the Lower Permian to Jurassic, the sediments of the Nosib, Otavi and Mulden Groups of the Damara Sequence were covered by sedimentary deposits up to 360 m thick and volcanics of the Karoo Sequence. A succession of semi-consolidated to unconsolidated sediments of the Kalahari Sequence of up to 600 m thick overlay the intrusive and extrusive rocks of Karoo Age.

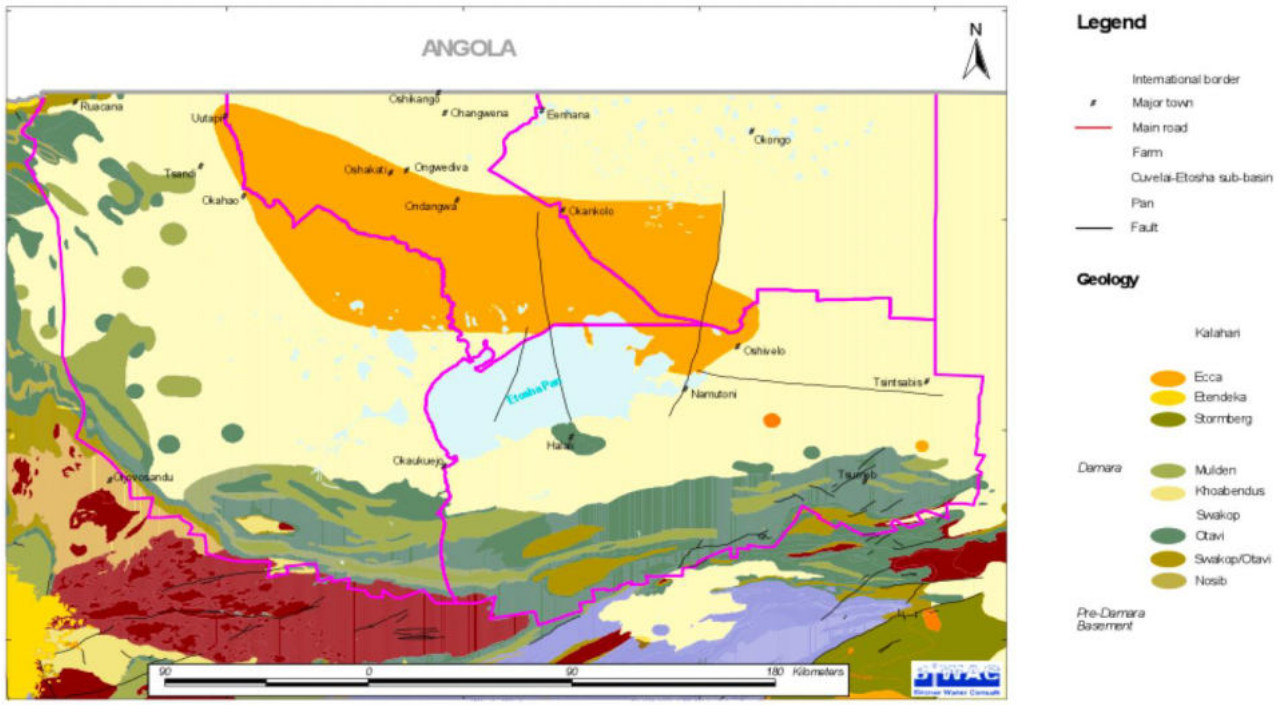

Figure 10: Geology of the Cuvelai Basin. Source: LCE, 2022.

In the Project Area, the areas to the east and immediately south of Ruacana are underlain by Kalahari and Namib Sands, which as part of the Kalahari Group (70 million years ago to the present), fall within the youngest

[15] Mendelsohn et al., 2022: Atlas of Namibia: A Portrait of the Land and its People (updated version). Cape Town: David Philip Publishers.

geological division encountered in Namibia. To the west, including the area immediately surrounding Opuwo, the Project Area is underlain by Otavi Group rocks of the Damara Supergroup and Gariep Complex formed between 850 and 600 million years ago[16].

6.1.3. Soils

The soils to the south and southeast of Ruacana are Ferralic Arenosols which have formed from wind-blown sand and feature high contents of combined oxides of iron and aluminium[17]. Reflecting the more varied geology, a variety of soil types are found in the western parts of the Project Area, including around Opuwo. These include rock outcrops, Lithic Leptosols (very thin or shallow soils in hilly or undulating areas) and Petric Calcisols (accumulations of calcium carbonate or calcrete in depressions which form a solid layer at a shallow depth) [18].

In the east, the high percentage of sand particles (above 60%) in the soils determines the texture and accounts for the very low water retaining capacity of these soils. Organic matter in the topsoil is low (less than 1 % on the higher sand ridges and less than 5 % in the Oshana soils). The nitrogen content is too low for horticulture and the soils are deficient in most of the major nutrients. In higher-lying areas the calcium content is low, especially in loose sands, while the soils in the *iishana* are rich in calcium. Potassium content is low, especially on the higher-lying areas where crop cultivation takes place, and phosphorous is low throughout the area. The soils are also deficient in micronutrients such as manganese, iron and zinc. The sandy soils of the iishana area are therefore not very fertile[19].

6.1.4. Topography

A sharp escarpment separates the rugged western part of the Project Area from the sandy, gently undulating terrain of the eastern portion. West of the escarpment the topographic relief ranges between 980 and 1,080 m above mean seal level (AMSL). The elevation below the Ruacana Falls, which has a height of about 130 m, is 750 m AMSL. In the north western corner, the watercourses discharge into the Kunene River, which flows in a south westerly direction from the central highlands of Angola and turns to a westerly direction downstream of the Ruacana Falls[20].

Except towards the west, where the land rises gently to the escarpment and more steeply to Opuwo, the topography in the eastern section of the Project Area is characterised by a flat plain, which forms part of the

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[16] Mendelsohn et al., 2009: "Atlas of Namibia: A Portrait of the Land and its People", J. Mendelsohn, A. Jarvis, C. Roberts and T. Robertson, ISBN 978-1-920289-16-4, Published for the Ministry of Environment and Tourism by Sunbird Publishers, Cape Town, South Africa, Third Edition 2009.

[17] Mendelsohn et al., 2009: "Atlas of Namibia: A Portrait of the Land and its People", J. Mendelsohn, A. Jarvis, C. Roberts and T. Robertson, ISBN 978-1-920289-16-4, Published for the Ministry of Environment and Tourism by Sunbird Publishers, Cape Town, South Africa, Third Edition 2009.

[18] Mendelsohn et al., 2009: "Atlas of Namibia: A Portrait of the Land and its People", J. Mendelsohn, A. Jarvis, C. Roberts and T. Robertson, ISBN 978-1-920289-16-4, Published for the Ministry of Environment and Tourism by Sunbird Publishers, Cape Town, South Africa, Third Edition 2009.

[19] Alexander and Becker, 2000: "*Planning Report on the Water Supply to the Ruacana South Area in the Omusati Region. Volume 1: Main Report*", Draft Report to the Department of Water Affairs in the Ministry of Agriculture, Water and Rural Development, by Alexander and Becker CC (Alexander and Becker), Windhoek, May 2000

[20] Alexander and Becker, 2000: "*Planning Report on the Water Supply to the Ruacana South Area in the Omusati Region. Volume 1: Main Report*", Draft Report to the Department of Water Affairs in the Ministry of Agriculture, Water and Rural Development, by Alexander and Becker CC (Alexander and Becker), Windhoek, May 2000

Etosha depression and gradually descends south-eastwards towards the Etosha Pan. The gradient of the *iishana* in the Project Area is approximately 1:7,500. The elevation of the plain is between 1,100 and 1,180 m AMSL. The area is traversed by shallow, discontinuous, ephemeral watercourses called iishana (singular – oshana) that originate in Angola. Between the undulations of this plain, short and discontinuous ephemeral drainage streams occur. Influenced by the sandy nature of the soil and the ephemeral flow in the watercourses, the drainage system is generally poorly developed[21].

6.1.5. Geology, Topography and Soils and Their Influence on Pipeline Construction

To the east and southeast of Ruacana, where the terrain is relatively flat and the soils are predominantly sandy, pipelines can easily be buried with little to no "hard rock" excavation required, except in isolated outcrops. Towards the west, west of the escarpment and towards Opuwo, the terrain is undulating, featuring rock outcrops and thin soil cover as well as drainage lines, and buried pipeline construction will be more difficult, time consuming and expensive than in areas to the east.

6.1.6. Hydrology (Surface Water)

Omusati region is part of the Cuvelai-Etosha Basin. The main water source in the Project Area is the Kunene River and the Calueque Dam in Angola. Water from the Calueque Dam in Angola is pumped a short distance over the watershed into the Calueque – Oshakati Canal which conveys this water into Namibia and then as far as Oshakati under gravity. There are other dams and surface rivers in the project area.

The Kunene or Cunene River is a transboundary water resource that arises in west-central Angola, about 32 km northeast of Huambo in the Sierra Encoco Mountains in Angola and flows southwards from the Angolan highlands to the border with Namibia, then turns westwards, forming the border between these two countries, until it reaches the Atlantic Ocean. The Kunene River basin covers an area of 106,500 km^2, of which 14,700 km^2 (13%) is located in Namibia and 95,300 km^2 in Angola. The Kunene River is 1,050 km long and is one of the relatively few perennial rivers in this region, with a mean annual discharge of 5.5 km^3/a at its mouth[22]. The location of the Kunene River basin in shown in Figure 11.

[21] Alexander and Becker, 2000: "*Planning Report on the Water Supply to the Ruacana South Area in the Omusati Region. Volume 1: Main Report*", Draft Report to the Department of Water Affairs in the Ministry of Agriculture, Water and Rural Development, by Alexander and Becker CC (Alexander and Becker), Windhoek, May 2000

[22] LCE, 2009: "*Water Supply Infrastructure Development and Capital Replacement Master Water Plan for the Central North Water Supply Area*", Report for the Infrastructure Planning Division of the Namibia Water Corporation Ltd. (NamWater), Report No. NWC-IPNZWW106, by Lund Consulting Engineers CC (LCE), Windhoek, September 2009

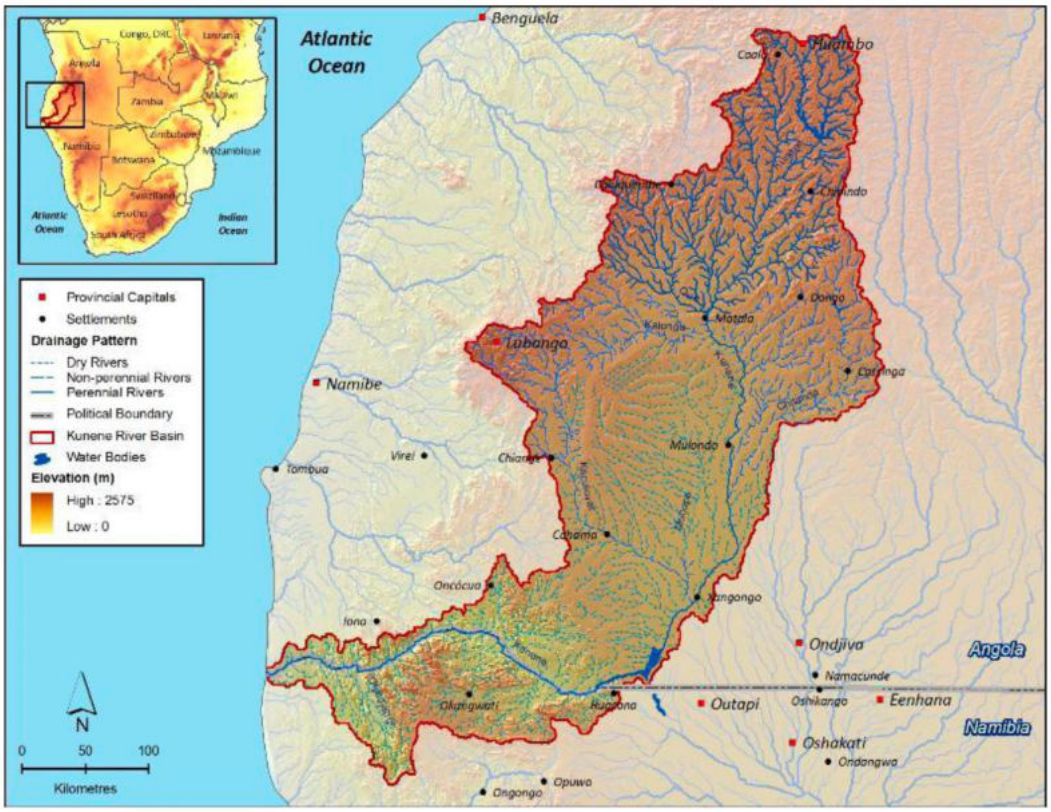

Figure 11: The Kunene River Basin (Kunenerak). Source: LCE, 2022.

6.1.7. Geohydrology (Groundwater)

The Omusati Region mostly the south-western parts and the Uukwaluudhi area north towards Ruacana are among the areas of the Cuvelai-Etosha Basin in the study area with best groundwater quality (class A and B). This also explains why currently there is reliance to groundwater in some parts of the project area. However, other portions of the project area have very poor underground water quality with significant concentrations of fluoride hence the need to include all the project phases (1 – 4) under piped water supplied by surface water resources that is treated.

6.2. Biological Features

The Omusati Region has one biome, namely the Savanna. The biodiversity features of the project area identified and addressed below:

6.2.1. Fauna

The Omusati Region is a land of striking biodiversity, characterized by its unique blend of ecosystems, ranging from arid savannahs to seasonal wetlands. This diversity has nurtured a rich variety of mammals and reptiles, each uniquely adapted to the region's semi-arid climate.

Fauna species found in the area consists of the following:

- Wildlife – mammals and reptiles
- Bird species
- Snakes

The details of the fauna species in the project area are provided in Appendix A, including some of the mitigation measures to protect the biodiversity during phases of the project development.

6.2.2. Flora

The Omusati Region in Namibia is characterized by a semi-arid to arid environment, which significantly influences its vegetation. The Project Area predominantly falls within the Acacia Tree and Shrub Savanna Biome. South and southeast of Ruacana, located in the Ferralic Arenosols soils, broad-leafed woodlands of the Western Kalahari are dominant[23] featuring Mopane savannah (Colophospermum mopane) with annual grasses on poor quality soils stretching over extensive flat plains of the Omusati Region[24]. The vegetation changes from a community of open, short shrubs dominated by acacia species and Mopane in the south, to heterogonous savannah of taller Mopane in the far north. Grasslands occur on the heavier saline soils in the northeast. The *iishana* are often lined with trees and bushes. In the west and around Opuwo, below the escarpment, underlain by various soil types associated with rocky areas and calcrete, grasslands and scattered trees are the dominant structure of the Western Highlands vegetation type[25].

The following tree species were identified in the study area:

- Mopane Tree (Colophospermum mopane) Dominant in most part, however as you move toward Ruacana Combretum collinum and becomes dominant.
- Ana Tree (Faidherbia albida).
- Commiphora Species: They are known for their resin and are often used in traditional medicine. (Found Ruacana side).
- Sickle Bush (Dichrostachys cinerea).
- Hyphaene petersiana (found throughout).
- Combretum collinum (Found Ruacana side).
- Pechuel-Loeschea leubnitziae: dominant herd found throughout, even along the road.
- Terminalia prunoides

Detailed list of vegetation that were observed along the project route and their status are provided in Appendix A. The procedure for removal of any protected tree species that interferes with project activities is outlined in Appendix A including the regulatory framework that guides such processes.

6.3. Socio-economic Features

6.3.1. Population

[23] Mendelsohn et al., 2009: "Atlas of Namibia: A Portrait of the Land and its People", J. Mendelsohn, A. Jarvis, C. Roberts and T. Robertson, ISBN 978-1-920289-16-4, Published for the Ministry of Environment and Tourism by Sunbird Publishers, Cape Town, South Africa, Third Edition 2009.

[24] Alexander and Becker, 2000: "*Planning Report on the Water Supply to the Ruacana South Area in the Omusati Region. Volume 1: Main Report*", Draft Report to the Department of Water Affairs in the Ministry of Agriculture, Water and Rural Development, by Alexander and Becker CC (Alexander and Becker), Windhoek, May 2000

[25] Mendelsohn et al., 2009: "Atlas of Namibia: A Portrait of the Land and its People", J. Mendelsohn, A. Jarvis, C. Roberts and T. Robertson, ISBN 978-1-920289-16-4, Published for the Ministry of Environment and Tourism by Sunbird Publishers, Cape Town, South Africa, Third Edition 2009.

The 2011 Population and Housing Census counted some 847 250 people in the Ohangwena, Omusati, Oshana and Oshikoto Regions, which comprised approximately 40% of Namibia's total population at the time[26]. In 2016, the population of these four regions was estimated as 889 790[27]. These four regions however comprise only 10% of the area of Namibia, resulting in population densities well above the national average. Thus, more water is needed for household and livestock in the area compared to other regions.

However, between among those four regions, The Omusati Region features much lower population densities than the Ohangwena and Oshana Regions, whilst the Kunene Region features the lowest population densities. In general, the population densities in the Project Area can be expected to fall between those of the Omusati and Kunene Regions as a whole (regional averages), given that the area effectively straddles a portion of the boundary between these two regions and covers the transition area between the higher population densities in the central Cuvelai to the east and the lower densities of the Kunene Region to the west[28].

6.3.2. Economy

Poverty: In 2021, Omusati Region had a headcount multidimensional poverty rate of 50.7%[29]. Although Omusati region is not among the highest regions (Kavango East and West) with multidimensional poverty rates, However, in terms of the population counts, the regions with the highest number of poor people are Ohangwena, Khomas and Omusati[30], thus providing potable water in the region improve the economic and social welfare of the people in the region. This is because potable water would allow people to address health issues from drinking unsafe water, minimise time spend on collecting water and direct that to other economic activities especially for women. Also there are other direct economic benefits comes with provision of portable water in the region that will address the high poverty ration per head in the region.

Household Consumption: The Kunene and Omusati Regions show very similar annual rates of per capita consumption in 2015/16 (~N$14,000/capita), which are approximately half the national average (~N$28,000/capita), indicating that these two regions are among the poorest in the country – only the Kavango Regions (East and West) and the Zambezi Region are poorer[31].

Income: The major source of income in Omusati region is subsistence farming (39%) followed by salaries and wages (25%) and pensions (18%).

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[26] NSA, 2012: "*Namibia 2011: Population and Housing Census Main Report*", Namibia Statistics Agency (NSA). URL: https://nsa.nsa.org.na/wp-content/uploads/2021/09/Namibia-2011-population-and-housing-.pdf

[27] NSA, 2017: "*Namibia Inter-censal Demographic Survey: 2016 Report*", NSA, Windhoek, September 2017. URL: https://nada.nsa.org.na/index.php/catalog/30

[28] LCE, 2022: "*Ruacana South Water Supply Project: Phase 1: Preliminary (Concept) Design Memorandum Report*" submitted to Ministry of Agriculture, Water and Land Reform for the Namibia Water Sector Support Program (NWSSP). Contract No. P-NA-E00-005, by Lund Consulting Engineers CC (LCE), Windhoek, November 2022

[29] Namibia Statistics Agency: Namibia Multidimensional Poverty Index (MPI) Report 2021. URL: https://www.unicef.org/esa/media/9041/file/UNICEF-Namibia-Multidimensional-Poverty-Index-2021.pdf

[30] Namibia Statistics Agency: Namibia Multidimensional Poverty Index (MPI) Report 2021. URL: https://www.unicef.org/esa/media/9041/file/UNICEF-Namibia-Multidimensional-Poverty-Index-2021.pdf

[31] LCE, 2022: "*Ruacana South Water Supply Project: Phase 1: Preliminary (Concept) Design Memorandum Report*" submitted to Ministry of Agriculture, Water and Land Reform for the Namibia Water Sector Support Program (NWSSP). Contract No. P-NA-E00-005, by Lund Consulting Engineers CC (LCE), Windhoek, November 2022

6.4. Water Supply in the Project Area

Increasing the availability of access to safe water has been one of the Namibian Governments key aims with Vision 2030, successive National Development Plans. Access to safe water in Omusati region is shown in Table 9. The portion of the Omusati Region's population with access to safe water (86%) almost exactly matches that of the average access in rural areas across the country (85%), perhaps mirroring the majority rural demographic of this region. The Kunene, Omusati, Ohangwena, Kavango East and West and Zambezi Regions are the only regions with less than 90% of their populations having access to safe water[32].

Table 9: Access to Safe Water Supply (NSA, 2017) [33]

Region	Percentage Distribution of Households by Main Source of Water for Drinking (%)						
	No. of Households	Piped Water Inside	Piped Water Outside	Public Piped	Borehole (Protected)	Bottled Water	Safe Water
Kunene	21,099	14.6	18.5	19.9	21.4	0.2	74.6
Omusati	54,383	14.2	47.5	16.3	7.4	0.3	85.6
Namibia	**589,787**	**30.1**	**33.4**	**21.6**	**7.0**	**0.8**	**92.9**
Namibia Urban	325,335	40.0	31.9	26.1	0.2	1.2	99.4
Namibia Rural	264,452	18.0	35.2	16.2	15.4	0.2	85.0

The relatively low access to safe water in the Omusati Region and the fact that the Kunene Region has the lowest access to safe water of any region in the country are the main reason or motivation for the RSWSP, which is specifically aimed at improving the access to safe, potable water in the Project Area which straddles the Kunene and Omusati Regions, thereby aiming to improve these statistics, bringing these two regions closer to par with the other regions and Namibia as a whole.

6.5. Archaeology and Cultural Heritage

An Archaeological & Heritage Impact Assessment (AHIA) was carried out for the project area by a qualified and experienced Archaeologist from TARO Archaeology Consultants. A low archaeological impact was observed in the project area. Only sites of cultural and social significance identified were formal and informal graves, cemeteries and burial grounds, these sites are subject to a buffer zone of at least a 20m radius (in situ protection and management). The detailed information can be accessed from the AHIA report in Appendix B.

6.5.1. Regional Aspect

The Omusati region is not well archaeologically explored as compared to Kunene or Erongo Regions, however, few areas are known to have sites that are of national significance (see Table 10).

[32] NSA, 2017: "*Namibia Inter-censal Demographic Survey: 2016 Report*", NSA, Windhoek, September 2017. URL: https://nada.nsa.org.na/index.php/catalog/30

[33] NSA, 2017: "*Namibia Inter-censal Demographic Survey: 2016 Report*", NSA, Windhoek, September 2017. URL: https://nada.nsa.org.na/index.php/catalog/30

Table 10: Declared Heritage Sites in the Omusati Region.

Designation	Description	Built/Construction Period	Location	Monument number
Onelungo Ponds	Cultural landscape		Outskirts of Outapi	155/2011
Omugulugwombashe	Monument		Omugulugwombashe	116/2004
Ombalantu-Baobab	Baobab		Outapi	155/2011
Monument of the unknown PLAN soldiers in Outapi	Monument to the unknown PLAN soldiers	September 2011	Outapi	
Okahao Baobab	Baobab		Okahao	155/2011
King Ipumbu Ya Tshilongo Memorial Site	Monument		Elim	275/2014

6.5.2. Local Aspects and Onsite Findings

Most of the findings related to this project were the graves and burial places. Details on the management of these graves and burial sites in the context of the project development are provided in the AHIA specialist report (see Appendix B).

7. PROJECT'S PUBLIC CONSULTATION AND ENGAGEMENT ACTIVITIES

7.1. Overview

Public and Stakeholder engagement was a key component of the EA process. Public consultation forms an important component of an Environmental Assessment (EA) process. The consultation provided I&APs the opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. The public consultation process, as set out in Section 21 of Regulation No 30 of EMA, has been followed during this assessment.

The public consultation process assisted in identifying all potential impacts and the extent to which further investigations are required. Public consultation also aids in the process of identifying possible mitigation measures. Gender issues were taken into consideration during the public consultation as water supply issues are gender sensitive.

7.2. Stakeholders (I&APs) Consultation Activities

7.2.1. Interested and Affected Parties (I&APs)

The study identified I&APs, who were considered interested in and/or directly and indirectly affected by the proposed project activities. The stakeholders pre-identified and registered are summarized below (see detailed list in Appendix C):

- MAWLR: Directorate of Water Resources Management
- MAWLR: Directorate of Water Supply and Sanitation
- NamWater
- Ministry of Environment, Forestry and Tourism and representatives
- Regional and local authorities, i.e., Omusati Regional Council, Constituency Offices (Ruacana and Onesi), Town Council and Settlement offices
- Respective Traditional Authority
- Primary beneficiaries / community representatives.

7.2.2. Communication with I&APs

A mix of approaches were used to communicate with I&APs. This consisted of newspaper adverts, in-person delivery of project material and notices, local radio announcements, site notices and word of mouth with various stakeholders. The following activities were undertaken during communication with stakeholder:

- Building a Stakeholder Database: A stakeholder database for the project was compiled with pre-identified key stakeholders throughout the ESIA Study. During the advertisement of the project (though public notices in local newspapers), the list was augmented as I&APs registered, and contact information of stakeholders updated.
- Circulation of the Background Information Document (BID) which contained brief descriptive of project information on proposed activities circulated with identified and registered I&APs. The printed copies of the BID were also distribution during consultation meetings.

- Placement of newspaper adverts (ESIA Study public notifications) in two different newspapers. The adverts were placed in the *New Era* and *Windhoek Observer* newspapers dated 30 June 2023 and 07 July 2023 –Appendix D (see Table 11). The project details were briefly explained in the newspapers and inviting members of the public to register as I&APs.
- Radio announcements for the ESIA Study's consultation meetings were made to the communities via the Omusati Regional Council's local constituency offices (Ruacana South and Onesi, Constituencies). The letter of notification and consultation was shared with the Office of the Chief Regional Officer for the Omusati Regional Council on the 29th of June 2023 (Appendix F) through which all regional correspondences should be sent.
- Site notices were placed throughout the study area in strategic positions where it can reach as many local communities as possible. The details of the site notices are shown in Figure 12.
- Consultation meetings: consultation meetings were held with stakeholders, local leadership and communities between 17 and 21 July 2023 in Omusati Region (see Table 12).

Table 11: Modes of Public notification and engagement for the ESIA Study.

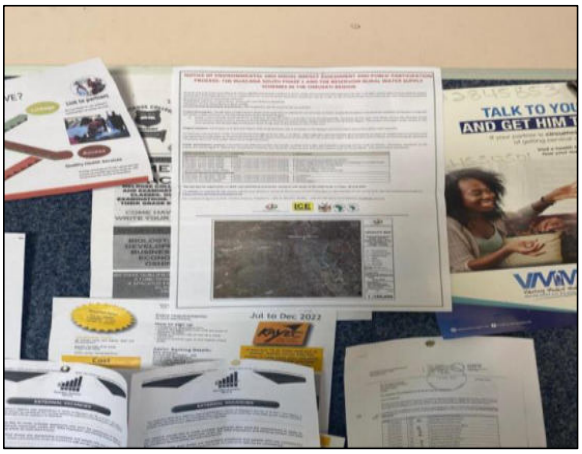
Mode of Consultation	Area of Distribution	Language	Action Dates
New Era	Country Wide	English	30 June & 07 July 2023
Windhoek Observer	Country Wide	English	30 June & 07 July 2023
Consultation Meetings	Regional and Local	English and translations in Oshiwambo	17 – 21 July 2023

Evidence of the site notices that was placed in different locations in the study area.

Ontoko Combined School, Olupandu, Onesi constituency

Omedhe village

Onesi Regional Council



Omaenene village

Eenawa village

Omayenkuzi village

Ruacana Constituency Office notice board

Figure 12: Site notices in different locations in the project area.

7.2.3. Stakeholders and Public (Community) Consultation Meetings.

Public consultation meetings were conducted with representations from the traditional authority, council representatives, regional council, residents, government and quasi-government departments and ministries.

A total of 265 people were consulted in different communities. Pertinent issues relating to the project were discussed and recorded in the meeting minutes for each meeting. Considering how potable water supply issues are gender sensitive, attendance of women was prioritized in the meetings and gender issues particularly comments from women were prioritized. These comments will inform some of the measures suggested in this document in Chapter 8 and 9 to micromanage these issues ensuring that women concerns' are prioritised. The meeting minutes and the attendance registers of the stakeholder consultation activities are attached in Appendix E. The summary details of the consultation meetings are provided in Table 12 below.

Table 12: Public meeting details for the ESIA Study

Date and Time	Activity	Venue	Constituency
Tuesday, 18 July 2023: 09h30	Public / Community Consultative Meeting	Omudhuwahauwanga Meeting Area	Ruacana South
Wednesday,19 July 2023: 14h00	Public / Community Consultative Meeting	Eunda Centre	Onesi
Wednesday, 19 July 2023: 09h30	Public / Community Consultative Meeting	Omusati Regional Council	Ruacana South
Thursday, 20 July 2023: 09h30	Public / Community Consultative Meetings	Omaenene	Ruacana South
Thursday, 20 July 2023: 15h30	Public / Community Consultative Meetings	Eenawa	Onesi
Friday, 21 July 2023: 09h30	Public / Community Consultative Meetings	Omayenkunzi	Onesi
Friday, 21 July 2023: 14h00	Public / Community Consultative Meetings	Otjitho Village Meeting point	Ruacana South

7.2.4. Gender Responsive community engagement

Given how potable water issues are gender sensitive especially in the provision of rural potable water, a gender responsive stakeholder consultation was carried out. Issues from women who are mostly responsible for water collection and management at domestic level were prioritised and the identified project impacts and corrective measures took into consideration these issues. Out of the 265 people attended the meetings in different communities in the project area (details in Table 13), majority of them were men, however, women comments were prioritised and were encourage to speak more about their issues regarding to water supply and the impacts.

Table 13: Gender statistics from the community stakeholder consultation carried in the project area.

MEETING VENUE	*DATE*	*NUMBER OF MEN*	*NUMBER OF WOMEN*	*TOTAL*
OMUSATI REGIONAL COUNCIL	14-Jul-23	6	4	**10**
OMUDHUWAHAUWANGA	18-Jul-23	30	22	**52**
OSHIFO	19-Jul-23	6	9	**15**
EUNDA	19-Jul-23	25	29	**54**
EENAWA	20-Jul-23	23	21	**44**
OMAENENE	20-Jul-23	25	13	**38**
OTJITHO	21-Jul-23	13	10	**23**
OMAYENKUZI	21-Jul-23	15	14	**29**
GRAND TOTAL		**143**	**122**	**265**

The pictorial meeting proceedings for Onesi and Ruacana South constituencies are provided in Figure 13 and Figure 14.

Figure 13: Public Meeting Proceedings in Ruacana South Constituency.

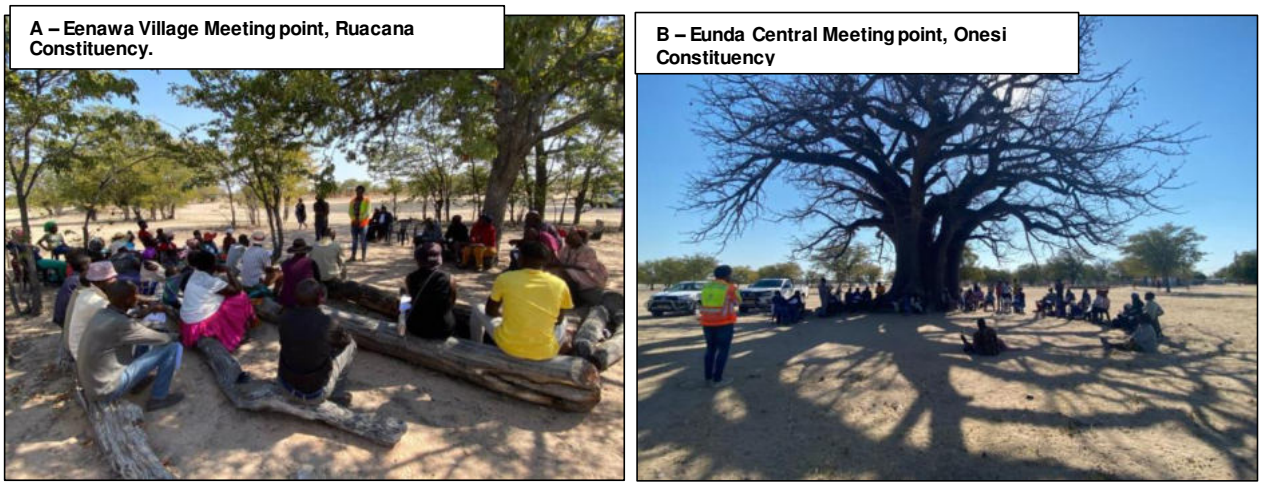


Figure 14: Public Meeting Proceedings in Onesi Constituency.

7.2.5. ESIA Study Comments Period

After the first newspaper notification on the 30th of June 2023, the I&APs were given until 28 July 2023 to submit their comments on the project. However, the comment period was remained open to I&APs until the final ESSR was submitted to MEFT.

7.2.6. Stakeholder Consultation Comments

Several issues were raised during the public consultation meetings and key stakeholder consultation engagement. Full details of all the issues raised during the consultation are provided in the consultation meeting minutes in Appendix E. Below is a summary of the key issues raised during consultation. They have been grouped into several categories in Table 14. Responses to these issues is detailed in Appendix E with consultative meeting minutes. Also, these issues were crucial in identifying potential positive and negative impacts of the project and in developing mitigation and corrective measures provided in Chapter 9.

Table 14: Summary of key issues noted throughout the consultation period (consultation meetings).

Category	Specific key issues raised
Land Use	- Clarification on whether there is going to be displacement of people and the process compensation of properties affected by water infrastructure going to be negotiated. - Interested in the exact pipeline routes. Interested in plans of the project preliminary designs.
Economic	- Employment of local people during project implementation mostly the youths and women. - If women are going to equally considered for the available employment opportunities? - How the recruitment and management and handling of labour associated with the project going to take place. - Express the urgent need for clean (good water quality) and accessible water supply in the communities. - Raised challenges of affordability of water and non-payment of accounts for water during operational phase.

Environmental	- Protected tree species were mentioned to be important, and compensation should be ensured. - Consideration of water for livestock by the project, (project should not be limited to human consumption only). - Water infrastructures should minimise passing through conservancies to minimize human-wildlife conflicts. - Protection of heritage and cultural sites and minimum disturbance of these areas.
Social	- Issue of water affordability (although access improves, communities are concerned on if water costs accrue, it should be afforded so that the marginalised and less privileged in communities can still access it without suffering social exclusion to water). - How are the issues of varying water pressure (head) in other communities going to be addressed? - Emphasised stakeholder Disclosure and continued engagement throughout the project planning and implementation. - Want to know if the graves are going to be relocated if pipelines interfere with cemetery areas. - The project times - urgency of the project as they have heard about the project since 1990s and with impacts caused to lack of access to clean water continues to grow each time the project delays. (Important to manage community expectations to avoid tension) - Concerned about groundwater (borehole water) quality issues (poor water quality (salty)), making the water unfit for human consumption. - Protection of cultural and spiritual sites such as graveyards, areas of worship (archaeology). - How vandalism of water infrastructures such as meters by some community members is going to be addressed. Suggest that the Installation of water meters should be close to the community/people for protection. - Project should avoid the exclusion to access water of some community members because of the social status or because of gender.
Technical/ Operation of the pipeline	- Discussion about the need for training to read water meters and the existence of different types of meters. - Concerns about to what extend the project will provide water especially from communities that do not have connection at present. - Lack of training of the communities on how to take meter readings. They are charged high because they are giving wrong figures to NamWater thus they end up not accessing the water due to higher bills that leads to cut off of water.
Payment of water	- Concerned about the existing system of community payment for the operation and maintenance of water infrastructure support such as generators.

7.2.7. Feedback: Draft ESSR Review

For review and further comments, the Draft ESSR Report with associated appendices was circulated to the I&APs for a specified period. D&P Environmental Consultants conclude that the public participation was extensive and transparent enough to ensure any comments or issues regarding the proposed development were addressed and to suggest possible mitigation measures. The potential impacts associated with the project activities are provided Chapter 8 where impact assessment methodology is described.

8. ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

8.1. Overview

Potential impacts (positive and negative) were identified by the assessment. Stakeholder consultation and field assessments augmented by literature review were used to identify the project impacts described below. The methodology applied to assess the impact factor of the negative consequences of the project is fully described and justified.

8.2. Impact Assessment Methodology

The recommended corrective/mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable development and operational conditions of the project for various features of the biophysical and social environment. An international criterion (IFC 2012 Methodology) was applied to establish the impact of the negative impacts to the receiving environment. The methodology is described in Table 15 and Table 16.

Table 15: Impact Assessment Criteria (IFC, 2012).

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%

8.2.1. Impact Significance

Impact significance was determined through a synthesis of the above impact characteristics. This involved combining duration of the impact, magnitude, the spatial extent of the impacts, the type and probability of the adverse impact happening to give the significance class/ output. The significance of the impact "without mitigation" was the main determinant of the nature and degree of mitigation required. Once the above factors (in Table 15) have been ranked for each potential impact, the impact significance of each is assessed using the criteria in Table 16.

Table 16: Adverse Impact Significance classification. Adopted from the IFC, Standards of 2012 (updated 2021).

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 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

In addition to the international standard procedure, the impacts assessment also considered the AfDB key environmental policies triggered, and these are presented in Table 17 below.

Table 17: AfDB Key Environmental Policies Triggered.

No.	AfDB Key Environmental issues triggered	Key	Yes	No
1.	Reversing Land Degradation and Desertification	RLDD	[√]	[...]
3.	Protecting Global Public Goods	PGPG	[√]	[..]
4.	Improving Public Health	IPH	[√]	[..]
5.	Enhancing Disaster Management Capabilities	EDMC	[√]	[..]
6.	Promoting Sustainable Industry, Mining, and Energy Resources	PSIMER	[√]	[..]
7.	Improving Urban Environmental Management	IUME	[..]	[√]
8.	Environmental Governance	EG	[√]	[..]
9.	Institution and Capacity Building	ICB	[√]	[..]
10.	Increasing Awareness	IA	[√]	[..]
11.	Stakeholder Participation	SP	[√]	[..]

The description and assessment of potential impacts stemming from the proposed activities is presented under the following subsections.

8.3. Description of Identified Potential Impacts

The potential impacts from the proposed project activities are described in Table 18, and assessed in Table 19. The management and mitigation measures in the form of management action plans are provided in the Draft ESMP.

Table 18: Description of the project activities' impacts on biophysical and social environment.

IMPACTS	IMPACT DESCRIPTION
POSITIVE IMPACTS – Construction Phase	
Employment creation and income generation	The project activities will create employment to the locals – for both skilled, semi-skilled and unskilled (casual labour) during the construction of the project. The engineering works associated with the project mostly on trenching of the pipeline, operation of the construction vehicles and equipment, labour for lifting construction material etc. will require both skilled and unskilled labour. These employed locals will be able earning income that support families.
Skills transfer	With the employment of locals in the project working with skilled labour such as engineers, drivers, excavator operators among others result in special skills transfer for the locals.
Empowerment of local businesses	Procurement of local goods and services for construction by small and medium businesses will promote local entrepreneurship empowerment and local economic development (income generation).
Economic boost of the local economy	Sudden influx of people in the project area means that the local economy will grow as these people will bring or generate money whilst in the area and use it within the communities where they will be doing the projects.
Positive Impacts – Operation Phase	
Economic benefits from improved safe, easily accessible clean water	Improved access to clean water means other household micro-economic activities can be implemented by communities which boost the local economy. The availability of clean water will boost investment capacity of the project areas (where there is water, there is life and opportunities).
Health benefits from improved potable water access	In addition, clean safe water has several benefits including fighting against diseases like Typhoid, Cholera. Also, COVID-19 was a clear example of how improved water access is essential in protecting the public and improves fighting against diseases.
Gender equality benefits	Improved access to safe drinking water reduces the burden on women and girls of collecting water, walk long distances that sometimes exposed them to harm, reduce school attendances. This will give them more time for productive endeavors, education and contributes to other economic activities.
Water Infrastructure development and betterment of the communities	Access to clean and safe water will improve the livelihood of the community, and eventual socio-economic empowerment through access to a crucial service such as water.
Climate change adaptation	Sustainable water management helps society adapt to climate change by building resilience, protecting health and saving lives. It also mitigates climate change.
Employment creation and income generation	The project activities will create employment to the locals – for both skilled, semi-skilled and unskilled (casual labour) during the construction and operation phases. The engineering works will require both skilled and unskilled labour, maintenance of the infrastructure may require both skilled and unskilled labour from the area. These employed locals will be able earning income that support families.

IMPACTS	IMPACT DESCRIPTION
NEGATIVE (ADVERSE) IMPACTS	
Planning Phase	
Conflicts	Potential conflicts at planning phase when there is no proper communication of the project's GRM that limits transparency and participation of affected parties early in the project implementation.
Operational Phase	
Occupational and community health and safety risks/hazards.	Project workers, locals and animals may be exposed to health and safety risks from heavy vehicles, improper securing of equipment and fuel storage area. Another potential risks to both people and animals would be unfenced or unclosed trenches that could pose a risk of unsuspecting/unaware people, and or animals falling into the open trenches leading to injuries. The use of heavy equipment, and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel and locals.
Conflicts	Potential conflict among the community members or communities due to unequal access to water caused by several factors among low head, aging pipelines leading to bursts, and stealing of water meters between different water users.
Limited opportunities for the local population	This is a malpractice resulted from 'Outsiders' given the employment opportunities over locals, leading to conflicts especially for skills or labour that can be supplied by the locals.
Construction Phase	
Physical disturbance of the soil	The excavations and land clearing to enable siting of project structures and equipment will potentially result in soil disturbance through site establishment, access road creations and unnecessary offload driving. These would leave the site soils exposed to erosion (areas with no to little vegetation cover to hold the soils in place). The movement of heavy vehicles may lead to compaction of the soils during construction and slightly during operations. This will, however, be a short-term and localized impact.
Biodiversity loss: domestic and wild fauna as well as flora	There are some large indigenous trees located along the potential pipeline route, on which the project activities will take place. Some vegetation (particularly protected species) may need to be removed should the linear infrastructures such as pipelines deviate from the current road route alignment. The clearing of land to create project access roads, setting up project equipment and infrastructures, may lead to floral disturbance. This may also lead to habitat destruction for some fauna. To mitigate this impact, care will need to be taken during the removal of vegetation for site preparation to ensure minimal disturbance in the area. In other words, the clearing of vegetation, where deem necessary will be limited to the specific route and minimal, therefore, the impact will be localized, site-specific, therefore manageable. Furthermore, given wildlife numbers in the area, potential of illegal hunting (poaching) of local wildlife by project workers exists. This could lead to loss or number reduction of specific faunal species which also impacts tourism in the community.
Impact on Land Use Change (Aesthetic value)	The excavation works to lay pipelines may leave scars on the local landscape, especially when the trenches are excavated close to the roads and not properly filled or they are left open for long. This may contrasts the surrounding landscape and thus may potentially become a visual nuisance to road users and locals.

IMPACTS	IMPACT DESCRIPTION
Impacts on surface and groundwater resources (abstraction, and pollution)	Water will be required during construction but mainly for domestic use, thus, there is a low risk of abstraction of water resources during the construction phase. It is anticipated that water will be sustainably abstracted during operational phase. However, there is a risk of soil and water pollution during construction when there is handling of pollutants such as oils, fuels and grease. Improper handling and storage of these may lead to pollution especially during heavy rainfall (rainy season between December and March) when surface run off is amplified. The amount of pollution would also depend on the volume of the pollutant spilling on the ground surface.
Waste generation	Waste types such as solid, wastewater and possibly hazardous will be produced onsite during construction, mainly, if the waste is not properly handled or disposed of in a responsible way. The mishandling of solid waste may result in environment pollution which can cause visual nuisance or worse, consumed (ingested) by local animals (both domestic and wild) which could be detrimental to their health.
Culture, heritage and archaeological impacts	The proposed project activities are likely to involve the removal of topsoil to enable earthworks in the form of clearing, excavating, removing, or sitting of the project equipment. The inadvertent unearthing in the subsurface may result in the destruction of heritage resources.
Occupational and community health and safety risks/hazards.	Project workers, locals and animals may be exposed to health and safety risks from heavy vehicles, improper securing of equipment and fuel storage area. Another potential risks to both people and animals would be unfenced or unclosed trenches that could pose a risk of unsuspecting/unaware people, and or animals falling into the open trenches leading to injuries. The use of heavy equipment, and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel and locals.
Health and social pathology (risk of HIV/ AIDS)	The sudden influx of people coming for the project will potential result in increased prostitution and associated social pathologies and health risks. This may increase the spread of HIV/ AIDS in the project area and other STI.
Displacement of properties	The potential of infrastructure such as pipelines to pass through crop fields may result in loss of productive land as the pipeline trenches and servitude areas would be not utilized for crop production, particularly deep plough that may damage buried pipelines (activities that require opening of new land). If not properly planned for or amiable solution is not reached between MAWLR, construction contractor and affected land/crop field owner, this may lead to conflicts between the two parties.
Air quality (emissions of GHG)	Vehicle movements of the engineering works will produce carbon and other GHG into the atmosphere in the project area.
Conflicts	Two types of conflicts. Potential conflicts between communities and outsiders coming for construction of the water infrastructure, and conflicts Communities dissatisfied with the activities. Nuisances caused by the building contractor.
Noise generation	There is a potential of noise from certain construction activities (excavation, movement of heavy vehicles and operation of heavy equipment) may be a nuisance to communities and wildlife in the area. Excessive noise and vibrations without any protective measures in place can be also a health risk to workers on site, if no measures are in place.
Dust generation	Vehicle movements in the project area that carry equipment and other construction vehicles (excavators, tippers) generate a lot of dust considering the sandy conditions in the study area. Dust will be also generated from excavations during trenching to install underground pipeline.

IMPACTS	IMPACT DESCRIPTION
Vehicular traffic safety	The local roads are the main transportation routes for all vehicular movement in the project area. Therefore, there would be a potential increase in traffic flow especially during the delivery of supplies, materials and services to site. Depending on the project needs, trucks, medium and small vehicles will be frequenting the area to and from working sites in the area. This would potentially increase slow moving heavy vehicular traffic along these roads, which may cause road accidents. There is a potential risk of road accidents during rainy seasons when the road connections in the Region is expected to be in bad conditions for traffic movement. Therefore, if construction vehicles travel to site between December and March, this might impact vehicular traffic and safety. Construction works will be undertaken in stages, on certain days of the week, few vehicles and the work will be temporary. Therefore, the risk is anticipated to be short-term, not frequent
Impact on local road use	The project activities will mean an increased movement of heavy trucks and equipment on the local gravel roads which would exert more pressure on these rural roads and worsening their conditions. This will be a concern if maintenance and care is not done particularly during the construction phase. The impact would be short-term and therefore, manageable.
Increases the climate risk	The project activities may increase the release of Greenhouse Gas (GHG) emissions during the engineering works associated with the construction – primarily from the operation of heavy motor vehicles. Potential removal of vegetation for pipeline route affects carbon sequestration by vegetation in the area thus increase climate change risk. However, the potential volumes arising during these activities and vegetation clearing will be localized in a linear form and are therefore have limited significance. No further screening or specific assessment of the risks of GHG emissions is required for the project. However, MAWLR (through their contractor(s) is advised that every opportunity to reduce GHG emissions during construction activities should be adopted. The primary GHG emissions reduction mechanisms to be incorporated into ESMPs are the preferential use of cleaner energy sources and the minimisation of energy consumption (adopt energy efficiency engineering works) during construction.
Decommissioning Phase	
Soil disturbance	The decommissioning of the infrastructure results in soil disturbances through removal of pipelines, and associated machinery. Also, the decommissioning of campsites by the contractors can significantly disturb the soil.
Disturbance to traffic	Activities associated with decommissioning may disturb traffic flow and these include road cuttings, excavations of trenches, temporary road closures/lane closures, heavy vehicle movement from trucks loaded with demolition material, and vehicle and pedestrian traffic deviations. These could result in traffic congestion and perhaps risks of accidents.
Air quality (emissions of GHG)	Emissions from the use of machines and dust production from infrastructure and equipment dismantling may result in a decrease in air quality impacting nearby residents, pedestrians and/or nearby activities.
Noise pollution	Noise generated through dismantling infrastructure and equipment could potentially impact on workers and neighbourhood residents.
Waste generation	Decommissioning of infrastructure and equipment may cause excess material generation. Equipment such as piping, valving, pumps, instrumentation and control equipment, can have residual values and can be sold or relocated off-site for reuse. Where recycling options are

IMPACTS	IMPACT DESCRIPTION
	possible these will be implemented prior to the last option of landfilling. Other waste such as lubricants, oils and greases must be treated as hazardous waste and disposed accordingly.
Occupational health and safety	Possibility of injury to workers from onsite accidents

8.4. Significance Assessment of the Potential Impacts.

The significance assessment of potential impacts associated with the project is provided in Table 19.

Table 19: The Assessment of biological, physical, and social impacts associated with the proposed activities (adopted from Outrun Consultants, 2022)[34].

Key: O – Operation phase, CO – Construction and Operation phases, C – Construction phase

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Vegetation Clearing	√	√	√	√	√	√	√		√		√	√	√	√	**CO**	**Short**	**Small**	**Local**	**Direct**	**Medium 25 - 75%**	**Minor (-)**
Air pollution	√	√	√	√			√	√	√				√	√	**CO**	**Short**	**Moderate**	**Local**	**Direct**	**Medium 25 - 75%**	**Minor (-)**
Soil pollution	√	√	√	√	√	√	√		√	√	√			√	**CO**	**Short**	**Small**	**Local**	**Direct**	**Medium 25 - 75%**	**Minor (-)**
Soil erosion	√	√	√	√	√	√	√		√	√	√			√	**CO**	**Short**	**Small**	**Local**	**Direct**	**Medium 25 - 75%**	**Major (-)**
Water resources pollution	√	√	√	√				√		√	√		√	√	**CO**	**Moderate**	**Moderate**	**Local**	**Direct**	**Medium 25 - 75%**	**Major (-)**

[34] Outrun Consultants. 2022: *Environmental Scoping Report for the Development of Ohangwena II Aquifer*. Windhoek. Unpublished.

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Water resources depletion	√	√	√	√	√			√		√	√			√	O	Permanent	Moderate	International	Direct	High >75%	Major (-)
Solid waste Generation	√	√	√	√		√	√	√	√	√	√		√	√	CO	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Major (-)
Vehicular Movements	√			√	√		√	√	√				√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Hazardous Substances storage and handling	√	√			√		√						√		CO	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Major (+)
Excavation of pipeline trenches	√	√	√	√	√	√	√		√	√			√	√	C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Construction camps establishment	√	√	√	√	√	√	√		√	√			√	√	C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Vehicular traffic	√			√	√		√			√			√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Water Supply		√	√	√				√		√	√		√	√	O	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Social Aspects Proliferation						√		√	√	√	√	√	√	√	C	Short	Small	Local	Direct	Low <25%	Beneficial Minor (+)
Boost in water reliant activities	√	√	√	√	√	√		√		√	√		√	√	O	Permanent	High	Regional	Direct	High >75%	Beneficial Minor (+)
Employment Creation	√			√	√			√		√	√		√	√	CO	Permanent	High	Regional	Direct	High >75%	Beneficial Major (+)
Livelihoods Development				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Climate Resilience	√	√	√	√				√			√				O	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Inclusion of Women and Children	√	√	√								√		√	√	CO	Permanent	Moderate	Regional	Direct	Medium 25 - 75%	Beneficial Minor (+)
Sanitation and Health Improved		√	√							√	√		√		O	Permanent	High	Regional	Direct	High >75%	Beneficial Major (+)
Skills transfer				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Economic benefits from improved safe, easily accessible clean water				√									√	√	O	Permanent	Moderate	Regional	Direct	High >75%	Beneficial Minor (+)
Developed Water administrative system		√	√								√		√		O	Permanent	High	Regional	Direct	High >75%	Beneficial Minor (+)
Land Use change	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)

Impact / Activity	Affected Environmental And Social Components														Project phase	Duration	Magnitude with project	Extent / Spatial scale	Type	Probability	Significance without mitigation
	Fauna and Flora	Water Quality	Water Quantity	Land Use	Soil and Slope Stability	Visual Intrusion	Air Quality	Human Settlements	Public Nuisance	Infrastructure & Services	Agriculture	Archaeology, Culture & Heritage	Occupational and Public Health & Safety	Source of Income							
Occupational Hazards													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Pressure on local services and Resources	√		√	√	√			√	√	√	√			√	CO	Short	Medium	Local	Indirect	Medium 25 - 75%	Minor (-)
Noise	√	√	√	√	√	√	√		√	√	√			√	C	Short	Small	Local	Direct	Medium 25 - 75%	Major (-)
Air quality issues (dust)	√	√	√	√	√	√	√		√	√	√			√	C	Short	Small	Local	Direct	Medium 25 - 75%	Major (-)
Community health and safety													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Impacts on water supply	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)
Labour													√		C	Short	Small	Local	Direct	Medium 25 - 75%	Minor (-)
Water Supply requirements	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)
Sexual Exploitation, Abuse and Harassment (SEAH)	√	√	√	√	√	√		√	√		√	√		√	CO	Permanent	Medium	Local	Direct	Medium 25 - 75%	Minor (-)

8.5. Recommendations and conclusion

The potential impacts (positive and negative) were co-identified between The Consultant and the stakeholders and I&APs during the consultations. The pre-identified negative impacts and issues raised were addressed and incorporated into this Report. The mitigation measures have been provided thereof in a form of action measures provide in the ESMP. These are provided to avoid and/or minimize their significance on the environmental and social components, while maximizing the benefits (potential positive impacts) of the project.

Impact Assessment: The key negative impacts were described, assessed. The potential negative impacts mostly indicated a medium rating significance, and this is due to the duration of the short-term duration of most activities, thus short-term and non-significant impacts (linked to the project phases).

To minimize the significance, appropriate management and mitigation measures made thereof for implementation by the Proponent, construction contractors and subcontractors to avoid and/or minimize their significance on the environmental and social components. The effective implementation of the recommended management and mitigation measures accompanied by monitoring will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low).

8.5.1. Recommendations

The Scoping assessment Study with the baseline archaeological and heritage assessment was deemed sufficient and concluded that no further detailed assessments are required to the ECC application for the project activities.

Therefore, D&P Engineers and Environmental Consultants are confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended corrective, management and mitigation measures proposed and with more effort and commitment put on monitoring the implementation of these measures throughout the project cycle.

With that said, the proposed project and associated activities can be granted an ECC, on condition that:

- All the management and mitigation measures provided in the ESMP are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use agreements (consents), services provision agreements (water and power provision) are obtained to ensure compliance with these specific legal requirements.
- Transparency in communication and continued engagement with stakeholders and communities and or through their leaders (such as the traditional authorities) should be maintained before project implementation and throughout the project cycle.
- MAWLR, their project workers or contractors (and subcontractors) comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals

required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.

- Project site area particularly where trenching (excavations) are done should be backfilled (stockpiled topsoil levelled), and rehabilitated, as far as practicable.
- The ESMP implementation onsite should be checked and done by the responsible team member onsite (Environmental Control Officer) and audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (Audit) Reports. These reports are to be submitted to the Environmental Commissioner.

8.5.2. Conclusion

The key potential biophysical and social impacts related to the construction, operational and maintenance and decommissioning phases of the proposed project were identified and assessed. Without any mitigation measures implemented, the impacts can be rated as of a slightly high to "medium" significance, but after the implementation of management and mitigation measures, the impacts' significance rating will be reduced to medium (for slightly high significance pre-mitigation), low (for medium rating pre-mitigation), and eventually negligible. The impact can be adequately addressed by the suitable recommended management and mitigation measures provided in the ESMP. The key potential negative impacts identified and addressed are as follows:

- Impact on land use change (aesthetic value).
- Physical land / soil disturbance resulting in compaction and erosion.
- Impact on fauna and flora (biodiversity).
- Impacts on surface and groundwater resources (abstraction, and pollution)
- Waste generation (littering).
- Culture, heritage and archaeological impacts, i.e., the inadvertent unearthing in the subsurface may result in the destruction of heritage resources.
- Occupational and community health and safety risks/hazards (during the construction and maintenance phase)
- Displacement of properties (during construction)
- Air quality (during construction)
- Noise (construction)
- Vehicular traffic safety, as well as Climate Change impact (during construction).

In conclusion, based on the information provided in this Report, D&P is confident the identified potential risks associated with the proposed project can be reduced to acceptable levels, should the measures recommended in the ESMP be effectively implemented and monitored. It is therefore recommended that the project receives an ECC.

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The ESMP incorporated all the issues raised by communities and key stakeholders to address the environmental and social impacts associated with project development. Comments and feedback from the stakeholders (in Table **14**) were vital for informing some of the corrective and management measures suggested in this EMP.

9.1. Aim of the ESMP

The EMA of 2007 requires that an Environmental & Social Management Plan (ESMP) to adopt a holistic approach to environmental management and encompass all components of the environment, biophysical, social, cultural, health and economic. The EMA and its regulations stipulate that an ESMP must include the following as a minimum:

- Information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure,
- Measures to rehabilitate the affected environment due to project or specified activities to its natural or predetermined state or to a land use which conforms to the generally accepted principles of sustainable development,
- A description of how the applicant intends to modify, remedy, control or stop any action, activity or process which will cause pollution or environmental degradation, remedy the cause of pollution or degradation and mitigation of pollutants.

The ESMP document is a legally binding document which compels the MAWLR to implement the proposed mitigation measures in an effective manner and in accordance with the set of conditions upon which an ECC will be granted by the Environmental Commissioner.

This ESMP has been developed as part of the Environmental & Social Impact Assessment (ESIA) for the proposed RSWSP Phase 1 to upgrade the water supply network in Ruacana South and Onesi Constituencies in Omusati Region. The document presents the proposed measures to manage and mitigate the identified impacts for the construction and operational phases of the project activities. This includes the maintenance, monitoring plan, indicators and associated ESMP implementation costs. Together with the ESR, the ESMP was fully shared with the registered Interested and Affected Parties (I&APs) and Stakeholders before submission to relevant authorities for review and approval.

The scope of the ESMP was aimed to meet the requirements of the Environmental Management Act, 2007 and its Regulations, 2012 and the African Development Bank's (AfDB) policies and guidelines.

9.2. ESMP Objectives

The purpose of this document is to provide a general framework for the Environmental and Social Management System (ESMS) planned to be implemented for the proposed project. It provides the necessary management

tools to ensure legal compliance and environmental best practice. Besides the legal and institutional requirements for the successful implementation of the relevant management plans, ESMP also determines the roles and responsibilities of the implementing agency (MAWLR), the Consulting Engineer and the contractor / sub-contractors. Its main objectives are to:

- Ensure the project is in compliance with applicable national environmental and social legal requirements and AfDB's safeguards policies and procedures,
- Outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project's beneficial impacts,
- Address capacity-building requirements to strengthen the implementing agency's safeguards capacities,
- Provide an overview of the environment, health and safety (EHS), socio-economic and cultural heritage policies, standards and legal legislation that the Project should comply with,
- Determine the roles and responsibilities of the Project Promoter, Consultant and Contractors in order to ensure compliance with EHS requirements during project implementation,
- Ensure that project activities are in compliance with EHS policies, standards and legal regulations, and
- Ensure reporting systems are developed and streamlined to deliver EHS compliance performance.

9.3. Amendments of the ESMP

Any party involved with the project can suggest changes to the EMP via the Environmental Control Officer (ECO). Such suggestions shall be discussed with the MAWLR and application for amendments to the project activities, and subsequently, the ESMP will be made to the Office of the Environmental Commissioner. Approved changes will be minute and drafted into the existing ESMP in the form of an appendix or amendments.

9.4. Penalties and offences under the EMA Act No. 7 of 2007

Non-compliance by MAWLR or project contractors attract fines and is illegal. Depending on the offence or omission of the law, fines are stipulated by the law. Section 30 of the EMA states that MAWLR or contractors commits an environmental offence if:

- (a) knowingly provides false or misleading information in any document submitted in terms of the Act to the Environmental Commissioner,
- (b) knowingly and without the consent of the EC makes or causes to be made any entry on a document, and
- (c) destroys or defaces any document; or alters or causes to be altered any entry on a document.

If MAWLR or contractors commits an offence in terms of the regulation above would be liable to conviction or a fine not exceeding N$100 000.00 or to imprisonment for period not exceeding 10 years or to both the fine and imprisonment.

The components contained in this ESMP which should be implemented by the Contractor and do not do as such attract non-compliance and shall be considered sufficient ground for the imposition of a penalty. Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- Unauthorized damage to natural vegetation,
- Failure to barricade work areas and prevent encroachment of domestic animals or any other unwanted guests,
- Unauthorized camp establishment (including stockpiling, storage, etc.),
- Hydrocarbons, hazardous material: negligent spills or leaks,
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance,
- Insufficient solid waste management (including clean-up of litter, unauthorized dumping, etc.,
- Erosion due to negligence, non-performance,
- Excessive cement, concrete spillage, contamination,
- Non-provision of adequate personal protective equipment,
- Insufficient fire control and unauthorized fires,
- Preventable damage to water courses or pollution of water bodies, and
- Non-induction of staff.

9.4.1. Fines and Penalties

The following fines and penalties are in place for transgressions listed below. It will be issued after the procedures contained herein has been duly followed and only in severe cases and after repeated non-compliance. The graveness of the transgression is justified by each specific penalty.

9.4.2. Fines

Fines may be issued per incident at the discretion of the Proponent's Project Manager – see next chapter. Such fines will be issued in addition to any remedial costs incurred as a result of noncompliance with the ESMP. The Environmental Control Officer (ECO) will inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from monies due under the Contract.

Fines for the activities detailed below, will be imposed by the ECO on the Contractor and/or his Subcontractors.

Any persons, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area.	N$2,000
Any vehicle guilty of reckless driving on and in the vicinity of the site, including excessive speeds.	N$1,000
Any vehicle being driven and items of plant or materials being parked or stored outside the demarcated boundaries of the site.	N$2,000
Persons repeatedly walking outside the demarcated boundaries of the site.	N$1,000
Persistent and un-repaired spilling of hazardous materials and materials causing pollution.	N$3,000
Persistent littering on site.	N$500
Individuals repeatedly not making use of the designated toilet facilities.	N$200
Disposal of waste other than agreed on in the waste management plan.	N$5,000
Deliberate lighting of illegal fires on site (e.g. outside of the designated camp site).	N$2,000

For each subsequent similar offence, the fine may, at the discretion of the Project Manager (in collaboration with the ECO), be doubled in value.

The Project Manager shall be the judge as to what constitutes a transgression in terms of this document.

9.4.3. Penalties

Where MAWLR through project activities inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, it shall be liable to pay a penalty fine over and above any other contractual consequence.

The MAWLR /Contractor is deemed NOT to have complied with this specification if:

- Within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the specification; environmental damage due to negligence;
- Safety of contractor personnel and public being compromised due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time;
- The Contractor fails to respond adequately to complaints from the public; and
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The Project Manager will be responsible for a report on the non-repairable damage and / or non-compliance with visual and other evidence as well as issuing the penalty to the contractor with the report attached.

A copy must be handed to the ECO.

The penalties that are recommended for the transgressions of the ESMP components are provided in Table 20 below.

Table 20: The penalties are suggested for transgressions.

Actions leading to erosion:	A penalty equivalent in value to the cost of rehabilitation plus 20%.
Oil spills:	A penalty equivalent in value to the cost of clean-up operation plus N$1,000.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of restoration plus N$2,000.
Damage to trees:	A penalty to a maximum of N$5,000 shall paid for each tree removed without prior permission, or a maximum of N$2,000 for damage to any tree, which is to be retained on site.
Damage to indigenous vegetation:	A penalty equivalent in value to the cost of restoration operation plus N$2,000.
Damage to sensitive environment:	A penalty equivalent in value to the cost of restoration operation plus 20%.
Damage to cultural sites:	A penalty to a maximum of N$100,000 shall be paid for any damage to any cultural historical site.
Damage to natural fauna:	A penalty to a maximum of N$2,000 for damages to any natural occurring animal.
Accident due to safety negligence:	A penalty to a maximum of N$50,000 for injuries to personnel or public.

9.5. Environmental Register

Environmental register should be kept on site in which environmental and social impact of the project activities is recorded. This will include information related to incidents such as spillages, dust generation and stakeholders' complaints as well as information relating to remedial actions implemented. It is recommended that the EM, ESO and the contractor(s) regularly update and maintains the register.

9.6. Assumptions and Limitations

The following assumptions and limitations underpin the approach to this ESMP:

- The information received from the stakeholders, desktop surveys and baseline assessments are current and valid at the time of the study and was used to form basis for this ESMP;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the document by the competent authority and other government departments; and
- No land claims have been registered for the proposed site at the onset and registration of the study.

9.7. ESMP Implementation Roles and Responbilities

As the Proponent, MAWLR is ultimately responsible for the implementation of the ESMP during the planning & design, construction, operational and decommissioning phases, but they may delegate this responsibility or part of it to someone else at any time, as they deem necessary. The transfer of responsibility should be clearly communicated and recorded. MEFT as the regulator (through the EC) is responsible for implementation of the Environmental Management Act, and MAWLR as the project Proponent are entirely responsible for the implementation of the project's ESMPs. The EC advises organs of state on the preparation of environmental plans, receives and records applications for ECCs and the overall management, protection, reviewing of the assessment report and enforcement of monitoring and implementation of environmental plans in accordance with the EMA. The roles and responsibilities of all parties involved in the effective implementation of this ESMP are set in Table 21.

Table 21: The roles and responsibility for implementing the ESMP.

Role	Responsibilities
MAWLR: **The Implementing Agency and Project Proponent**	MAWLR, as the implementing agency, will be responsible for: - Managing the implementation of this ESMP and updating and maintaining it when necessary. - Ensuring that the environment is rehabilitated to its natural state as far as possible. MAWLR shall ensure that all employees attend an Environmental, Awareness Training Course to increase compliance and reduce the environmental impact of the project activities. - The training course shall be structured to ensure that trainees/employees are capacitated with appropriate knowledge to:

Role	Responsibilities
	vi. Become familiar with the environmental, health, and safety controls contained in the ESMP. vii. Be aware of the importance to conserve water and minimise waste to ensure sustainable development. viii. Be aware of MAWLR's Code of Conduct. ix. Be aware that a copy of the ESMP is readily available as a reference at the site office and that all staff are aware of the location and have access to the document. x. Ensuring that there are employee information posters outlining the environmental "do's" and "don'ts" (as per the environmental awareness training course) will be placed at prominent locations throughout the site.
Proponent's Project Manager	- Ensuring that the objectives of this ESMP are achieved at the various project lifecycle phases. - Work together with ECO to ensure that this ESMP is implemented and that penalties and fines for non-compliances are enforced onsite. - Ensuring that all identified environmental impacts are managed according to the environmental principles of avoiding, minimizing, mitigating and rehabilitation. This will be achieved by the successful implementation of the ESMP. - Managing and monitoring of individuals and/ or equipment on-site in terms of compliance with this ESMP and issuing fines for contravening ESMP provisions. - Ensuring that appropriate environmental monitoring and compliance auditing is done and that biannual reports are submitted to the MEFT.
Contractor (Site / Construction Manager): **To be appointed by MAWLR.**	- The Contractor and / or its agents will be responsible for environmental management on site during the construction phases of the project. For the purpose of this document: "the Contractor" (and its sub-contractors) refers to construction personnel responsible for construction activities planned for this project. - The Contractor will appoint an Environmental Site Officer (ESO) who will be responsible for ensuring that the ESMP requirements are implemented on-site on behalf of the Contractor. - The contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the ESMP. Failure by any employee of the Contractor, Sub-contractor, and Suppliers etc. to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ESO to instruct the EM to have the employee removed from the site. - A pre-construction meeting is recommended to reach agreement on specific roles of the various parties and penalties for non-compliances with the ESMP. In addition, surrounding residents, landowners or occupiers of land must be notified in advance of any potentially disturbing activities.

Role	Responsibilities
Consulting Engineer (Planning & Design Engineer)	- The Engineer is ultimately responsible for the designing of the civil/structural, electrical, and mechanical aspects of the project prior to construction.
Environmental Site Officer (ESO): **To be appointed (as part of the Construction Contractor Team)**	The ESO is expected to administer and control all environmental matters during the construction phase. The ESO will be responsible for the following among others: xix. Identify non-compliance and recommend corrective measures in consultation with MAWLR's Project Manager, the EM and the ECO as required. xx. Ensure that environmental problems are remedied timeously and to the satisfaction of the Project Manager, and the ECO as required; xxi. Set up activity-based method statements prior to the start of relevant construction activities and submit these to the Project Manager, the EM and the ECO as required; xxii. Perform ongoing environmental awareness training of the Contractor's site personnel as and when required. xxiii. Ensure implementation of the ESMP. xxiv. Ensure safe keeping and easy accessibility of correct environmental records at all times. xxv. Ensure accurate and timely communication of ESMP requirements to relevant project, contractor and sub-contractor personnel as required for ESMP implementation. xxvi. Monitor compliance of ESMP implementation and compliance of all contractors and sub-contractors onsite. xxvii. Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the ESMP. This includes identifying additional project training requirements and implementing the training programme. xxviii. Update and maintain training records for all project personnel including contractors. xxix. Maintain environmental incidents and stakeholder complaints register. xxx. Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the ESMP implementation is at an optimal level. xxxi. Report significant incidents internally and externally as required by law and the conditions of authorization. xxxii. Investigate incidents and recommend corrective and preventative actions. xxxiii. Provide support and advice to the contractor and all sub-contractors in the implementation of environmental management procedures and corrective actions. xxxiv. Ensure that monitoring programs, which assess the performance of the ESMP, are implemented. xxxv. Ensure maintenance of site document control requirements. xxxvi. Assess the efficacy of the ESMP and identify possible areas of improvement or amendment required within the ESMP

Role	Responsibilities
Environmental Control Officer (ECO): **D&P Environmental Consultants**	The ECO for the site is an independent environmental consultant to monitor and review the on-site environmental management and implementation of this ESMP on the construction site. The duties of the ECO are to: - Ensure that all construction or decommissioning activities on site are undertaken in accordance with the ESMP. - Conduct environmental compliance audits and reporting as required by law. - Provide support and environmental advice to the project team, contractors, and all subcontractors in the implementation of environmental management procedures and corrective actions. - Report significant incidents internally and externally as required by law and the ECC conditions. - Ensure that ESMP performance monitoring programs are implemented. - Assist in incidents and non-conformances investigations and implementation of effective corrective and preventive measures. - Assess ESMP effectiveness and identify possible areas of improvement. - Facilitate the amendment of the ESMP in liaison with the Environmental Manager. - Provide environmental training for key project personnel (in liaison with Environmental Manager). xxxvii. Conducting site inspections of all areas with respect to the implementation of this ESMP (monitor and audit the implementation of the ESMP). xxxviii. Advising the Proponent or Site Manager on the removal of person(s) and/or equipment not complying with the provisions of this ESMP. xxxix. Making recommendations to the Proponent with respect to the issuing of fines for contraventions of the ESMP. xl. Undertaking an annual review of the ESMP and recommending additions and/or changes to this document.
Public Relations Officer (PRO): **To be appointed by MAWLR or form part of the Construction Contractor Team**	The key primary responsibility of PRO is implementation of Grievance Regress Mechanism (GRM). PRO will be specifically responsible for the following: - Liaising between the stakeholders, public (communities) and the Proponent. - Ensure effective communication with stakeholders, media (if necessary) and the public. - Organising and overseeing public relations activities, Managing public relations issues. - Preparing and submitting public relations reports, if required. - Collaborating with personnel and maintaining project-related open communication among personnel.

9.8. Environmental and Social Management and Mitigation Plan

Since the project's negative impacts to the receiving environment are experienced in all phases of project development, the management, mitigation and corrective measures also follows same structure to ensure that

impacts are well managed for all the four phases (planning & design, construction and post-construction), operations & maintenance and decommissioning). These measures are provided in the sections below.

9.8.1. Planning and Design Phase Measures

The management and mitigation actions plan or measures for this phase are presented under Table 22. The ESMP should be included in the bidding/ contract documents and their implementation should be contractual binding for the contactors.

Table 22: Planning and Design Phase - Management and Mitigation Plan.

Environmental and social Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
GRM Dissemination	When there is no proper communication of the project's GRM that limits transparency and participation of affected parties.	- Establish GRM and clarify roles and responsibilities (see GRM section of ESMP) - Provide contractor with GRM contact details to be used for: a. GRM sign boards; b. GRM Contact Cards for Affected People - Erect sign boards at the construction site entrance with: a. Project details. b. GRM procedures and contact details. - Print 'GRM Contact Cards' for all workers to give to complainants and keep cards with all vehicles, machinery and site managers/foremen. - Affected People Training. Contractor to raise awareness of all workers on how to respond when an affected person or member of the public has a complaint i.e., direct the person to the most senior site manager present at the time and provide a 'GRM Contact Card	- Ensure that contractors have a copy of GRM and the GRM registration forms	- Implementing Agency - Contractors	Included in Project Cost
Limited employment for local population.	The is a malpractice that resulted from 'Outsiders' given the employment opportunities over locals, leading to conflicts.	- Maximise on local labour especially for non-skilled labour force of the project. All unskilled labour shall be sourced from local communities. Specific recruitment procedures should be clearly outlined that consider locals first. - Out-of-area employment should be justified, for example by the unavailability of local skills. - The anticipated work opportunities and number of positions should be announced through the local leadership offices (both in Ruacana South and Onesi Constituencies, and local VDCs).	- Ensure that contractors make provision for detailed recruitment plan in their tender application.	Construction Contractor in partnership with the respective constituency councillors will determine employment considerations.	Included in Bid price

Environmental and social Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Local leadership should participate in the screening for employment to ensure that the opportunities reserved for the locals are not given to outsiders.			
	Gender inequality.	- Equal recruitment for all gender - At least 50% of recruits must be women for non-strenuous jobs.			Included in Bid price
Health and social pathology.	Increased prostitution and associated social pathologies and health risks.	- Prior to commencing construction, the risk of an increase in the spread of HIV/AIDS should be explained to regional health authorities and partners be identified amongst all stakeholders to formulate a joint programme to limit the spread of HIV during the construction period. - Contractors shall approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS education programmes periodically on site.	- Ensure that contractors that bid make a provision for the co-opting of an HIV/AIDS health officer from the regional health office in their tender application	Planning & Design Engineer in partnership with National and Regional HIV task forces and NGO's working in the field.	Included in Project Cost
	Health and safety risks to the workers and public due to uncontrolled access to the public during construction Unsafe traffic conditions. The lack of personal protective clothing, etc.	- Prior to construction all construction workers should undergo environmental induction.	- Ensure that contractors that tender make provision for environmental induction in their tender applications	Planning & Design Engineer Project Manager Environmental Site Officer (ESO):	Included in Bid price
Conflicts	Nuisances caused by the building contractor. Lack of communication between Contractor and communities	- A meeting should be arranged with the local community once the contractor has been appointed. - The contractor shall appoint an ESO from the construction team to take responsibility for the implementation of all provisions of this ESMP.	- Ensure that contractors that tender make provision for the appointment of an ECO in their tender application.	Planning & Design Engineer Project Manager Environmental Site Officer (ESO)	Included in Bid price

Environmental and social Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
			- Arrange a meeting once contractor has been appointed		
Accessing water sources in protected area	Nuisance to the biodiversity (flora, fauna, water ecosystem) due to dust, silt runoff, noise, etc.	- Increase sensitivity for construction and protection mitigation measures in the transmission line rehabilitation to all Springs especially when within the National Park boundaries. - Guarantee contractor is trained, accepts and follows all operational procedures applicable within the protected areas. Contractor must not: a. Kill, injure, damage, remove, handle, disturb or interfere with any endangered species or existing animals under any circumstances; b. Bring domesticated animals on-site; c. Poaching on-site or the surrounding forests; d. sell endangered species or derivatives of these species; e. export endangered or derivatives of these species; f. cleared trees without inspection for nesting birds prior to cutting. The nest will be transferred carefully to another tree safe from project activities.	-	Implementing Agency	Included in Project Cost
Compensation for land use (in the case of displacement of properties to make way for pipeline establishment)	Lack of consultation, clear communication, and clarity on the compensation.	- Compensation should be communicated and explained clearly to the affected landowner/land custodian (Headmen of the respective villages / Traditional authority). - The landowner should be compensated fairly and in accordance with the Policies and ensure harmony throughout the process.	- The Executing Agency must make provision for compensation of land loss due to construction activities	Proponent - MAWFL	Included in Project Cost
Vegetation loss	Loss of vegetation or land clearing as part of site preparation	- The routes for the planned facilities such as pump stations, reservoirs, pipeline routes should be located at the early stages of the project (before construction) and ensure that they are placed where there are no trees or minimum number of	- The ESO should investigate the finalized	Planning & Design Engineer Contractor	Included in Project Cost

Environmental and social Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		trees. - Make use of existing linear infrastructure such as roads to lay the pipelines alongside and make use of existing access roads. - Position new pipelines in such a way to follow existing access roads in the project area. - Avoid unique and special habitats or culturally protected areas. - Create buffers from special, sensitive and ecologically important habitats.	routes and advise the Contractor and Engineer		

9.8.2. Construction and Post-Construction Phase Measures

The management and mitigation actions plan or measures for construction phase are presented under Table 23. The ESMP should be included in the package of bidding and contractual documents and its implementation should be contractual binding between the executing agency and the contactors.

Table 23: Construction and Post-Construction Phase - Management and Mitigation Plan.

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Social Environment					
Conflict	- Communities dissatisfied with the activities. - Nuisances caused by the building contractor.	- Clear communication between contractor and community as well as stakeholders, on the schedule/timeframe for operations and the duration of the construction phase. This should be provided for in the form of a Public Consultation Plan (PCP) which should include at least: - One meeting for site-handover and to introduce the local community and farmers to the Contractor. - A system for the on-going management of the communication between the Contractor and local communities, which should	- Minutes of meetings - Draw up PCP	Project Manager, ESO and Contractor	Included in Project Cost

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		include; a means for lodging a complaint concerning construction activity, provision of feedback to the plaintiff from the Contractor stating how the issue is being addressed, report back on issues raised and how addressed from the Contractor to the Project Manager and Proponent, and detailed construction programme should be presented during a meeting with the local communities and stakeholders.			
		- Ensure that relevant stakeholders are adequately informed throughout construction and that there is effective communication with and feedback to the Project Manager and Proponent.	- Meetings and communication.	Project Manager, ECO and Contractor	Included in Project Cost
	Delayed construction, which has cost implications and causes low user satisfaction.	- Programme delays into the construction schedule should be timely communicated to the communities.	- Project Manager and Contractor to constantly monitor delays and adapt programme accordingly. - Constantly update stakeholders and communities on delays and latest schedules.	Project Manager and Contractor.	Included in Project Cost
	Poaching and trapping	- Poaching or trapping of animals is strictly prohibited and is a criminal offence.	- Project Manager, ESO and Contractor to monitor this	Contractor ESO	Included in Project Cost
Poaching (illegal hunting of wildlife) and animal trapping to	Presence of project workers (mainly outsiders) may lead to	- Commit to creating awareness among the project workers and the impact of such crimes on the host environment and country at large. - Report any suspicious activities related to wildlife crime to the nearest Police.	- Contractor and ESO to monitor this	Contractor ESO	Included in Project Cost

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
promoting biodiversity conservation	poaching of local wildlife in the area.	- To minimize the risk of poaching by outsiders, commit to hiring more locals for jobs that they can do, as they are likely to appreciate the importance of conserving wildlife in their areas. - Incorporate a No-tolerance rule for poaching in every employment contract and ensure that the workers understand the seriousness of this. In other words, there is no tolerance for poaching or to wildlife crime.			
Dangerous work area	Existence of dangerous/hazardous work areas	- The work areas must be set out and isolated and demarcated by means of danger tape on a daily basis. The demarcated work area may only contain materials, equipment, and personnel required to execute the work. - Once the work for the day is completed, the demarcated area must be cleaned of any spilled materials and waste products. This must be disposed of in the allocated containers. - If the work area is dangerous or sensitive, the danger tape should stay in place until work is complete or not sensitive anymore.	-Inspections for approval. -Record excavation / backfill schedule in the site instruction records.	Project Manager and Contractor.	Included in Bid price
Threats to the health and safety of construction workers.	Insufficient provision of safety equipment Negligent behaviour	- The contractor must adhere to the regulations pertaining to health and safety, including the provision of protective clothing, failing which the contract may be suspended with immediate effect. - Failure to remedy such lack of provision may result in the immediate cancellation of the contract according to the clauses stipulated in the Specific and General Conditions of Contract. - The contractor should comply with all relevant labour laws as stipulated by the Labour Act. - First aid kits to be readily available in case of injuries	- Regular visual inspection and records kept of safety equipment and materials issued.	Project Manager Contractor ESO	Included in Bid price
		- Dust protection masks shall be provided to staff members if they complain about dust.	- Regular inspections and attendance to work complains.	Project Manager and Contractor.	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Workers in the vicinity of sources of high noise should wear necessary protection gear.	- Regular Inspection	Project Manager and Contractor.	Included in Bid price
		- No person is allowed to smoke close to fuel storage facilities and in portable toilets at the construction site since the chemicals used in chemical toilets are highly flammable.	- Regular Inspection.	Project Manager and Contractor.	Included in Bid price
		- Workers should not be allowed to make use of the existing neighbourhood facilities. Potable water must be provided to workers to avoid dehydration.	- Regular Inspection.	Project Manager and Contractor.	Included in Bid price
		- Portable toilets should be available at the construction site in the following ratio: 2 toilets for every 50 females and one toilet for every 50 males.	- Regular Inspection.	Project Manager and Contractor.	Included in Bid price
	Low productivity and increase health risk of workforce due to high temperatures.	- Provide hats, ample drinking water. - Provide regular breaks.	-Daily checking of weather forecast.	Project Manager and Contractor.	Included in Bid price
	Accidental fire outbreaks (incidents)	- Foam and serviced fire extinguishers must be in close proximity to fuel kept on site and one extinguisher at the camp. - There should be two to three trained personnel and equipped with basic firefighting skills. - At least two extinguishers should be placed in the workshop. - No open fires should be created by project personnel on and around the site. - Consider using gas or paraffin cooks to prepare food instead of open fires. The cooks/stoves fire should be put out before leaving the camp.	-Foam fire extinguisher should be available when work commences.	Project Manager and Contractor.	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Make provision for smoking areas for crew members who smoke. This is to ensure that the cigarettes' fire is completely put out to and disposed of in allocated bins at the smoking area. - Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage. - Raise awareness to workers on the impact of careless handing of fires and flammable substances onsite.			
Health and social pathology.	Increase prostitution and associated social pathologies and health risks. Sex workers are hired from the local communities by the construction team.	- Prohibit unauthorized people on site and secure construction area, while monitoring entrance and exits. Contract penalties. - Workers are not allowed to reside on the construction site. - Engage workers in sexual health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. - Provision of condoms and sex education through distribution of pamphlets and health trainings. These pamphlets can be obtained from the nearest local health facility in the area, and if needed, health care services should be obtained Outapi.	- Daily monitoring by contractor. - Record visitors in a site-visit book	Contractor ESO	Included in Bid price
	- Health and safety risks to the workers and public due to uncontrolled access to the public during construction. - Unsafe traffic conditions, the lack of personal protective clothing, etc.	- During inductions, provide project workers with an awareness training of the risks of mishandling equipment and materials on site and health & safety risk associated with their respective jobs. - Project workers should be properly equipped with adequate and appropriate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. - Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible.	- Daily monitoring by contractor	Contractor ESO	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Workers should not be allowed to enter the working sites when under the influence of alcohol as this may lead to mishandling of equipment which results into injuries and other health and safety risks.			
Alcohol abuse.	Use of alcohol on construction site.	- At no stage may a construction worker be allowed on site under the influence of alcohol or any narcotic substances.	- Daily monitoring by contractor. - Spot checks.	Project Manager and Contractor	
Construction Area					
Disorderly and unwanted settlement in the pipeline reserve	Informal market stalls providing services to construction workers	- In consultation with the regional council and traditional authorities, to determine the conditions for of market stalls next to the road and at lay-byes. - No settlement will be allowed.	- Set conditions for market stalls. - Regular inspection of site.	Contractor	N/A
Construction site	Visual nuisance of the construction activities.	- The boundaries of the construction area shall be demarcated prior to any work commencing on the site. - The construction area should be clearly marked.	- Consulting Engineer and Contractor should agree on demarcation lines.	Project Manager and Contractor	Included in Project Cost
	Improper conduct on construction site.	- The construction area should adhere to the following requirements: - Access should be controlled and only workers allowed within the boundaries of the campsite: - Records should be kept, and all visitors should sign in and sign out of a visitors logbook - The contractor should in no way permit or allow prostitution to take place at the construction area.	- Regular visual and record inspection by the Project Manager.	Project Manager and Contractor	Included in Project Cost
Campsite Establishment					

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Negative impact on the social and ecological environment.	Establishment of campsite.	- One campsite should be established for all construction activity (i.e. for all three sites). - The contractor must negotiate the use of existing facilities before considering entering new terrain. - The contractor must receive approval to use a facility or land in writing. -This approval must state the remuneration and conditions of use. - Devise a layout for the site so that internal circulation of workers and vehicles in relation to the various construction functions is optimised.	- Contractor and Re should agree on a satisfactory area.	Contractor with approval of the Proponent and Traditional Authority	Included in Bid price
	Conduct on campsite.	- No one is allowed to reside on the campsite, save for construction personnel. - The campsite may act as a facility for the storage of construction material, temporary stockpile sites, and fuel installations etc., required by the Contractor or subcontractors and suppliers. - Materials must be stored in a separate closed-off premise that is sufficiently prepared to protect the environment for pollution, such as impermeable floors, closed containers and a security fence.	- Daily monitoring by contractor.	Contractor.	
	Stockpiling materials on site.	- Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site. - Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills.	- Daily monitoring by contractor. - Regular visual and records inspection by the Project Manager.	Project Manager and Contractor.	Included in Bid price
		- Stockpiles must be of a safe height of less than 2m high and 45° slope angle. - Protect all fluids containers from low temperatures to avoid leaks and pollution.	- Regular visual and records inspection by the Project Manager.	Project Manager and Contractor.	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Biophysical Environment					
Soil erosion and compaction	Unnecessary soil disturbance and excavations	- Stockpiled topsoil and materials should be used to backfill the excavated and disturbed site areas such as borrow pits. - Topsoil stripped from certain site areas to enable project works and can be returned to its initial position, should be returned. This is to avoid unnecessary stockpiling of site soils which would leave them prone to erosion. - Vehicles/machinery should stick to access roads provided and not to unnecessarily create further tracks on and around the site by driving everywhere resulting in soil compaction and erosion. - Unnecessary off-road onsite and neighbouring areas is strictly prohibited. Stick to approved site access roads.	- Daily inspection of the surface protection work	Contractor.	Included in Bid price
Soil pollution	Garbage, cement, concrete, sewage, chemicals, fuels, oils or any other objectionable or undesirable material.	- Hazardous waste should be disposed of in the prescribed manner in order to prevent contamination of soils. - In case of accidental spills, the contaminated soil must be suitably disposed of in a container for hazardous waste.	- Daily monitoring and regular visual inspection by contractor.	Contractor ESO	
	Soil pollution by fuel leaks	- If fuel is stored at the construction camp, fuel tanks must be properly bunded. The volume of the bunded area must be sufficient to hold twice the capacity of the storage tanks. The floor of the bunded area must be impermeable and the sides high enough to achieve the twice holding capacity.	- Daily monitoring by Contractor and regular visual inspection by ESO	Contractor ESO	Included in Bid price
		- Drip trays should be available for all equipment that is intended to be used during construction. These trays should be placed underneath each vehicle while the vehicles are parked. The drip trays should be cleaned every morning and the spillage handled as hazardous waste.	- Daily monitoring and regular visual inspection by contractor.	Contractor ESO	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
	Soil pollution by cement mixed on the ground.	- Under no circumstances should cement be mixed on open soil. A designated metal container should be made available for this purpose.	-Daily monitoring by Contractor and regular visual inspection by the ESO	Contractor ESO	Included in Bid price
	Cleaning of equipment.	- All cleaning of equipment should take place within the construction site and the water from washing operation should be collected in a tank and disposed of in agreed manner.	- Daily monitoring by Contractor.	Contractor ESO	Included in Bid price
	Heavy vehicles/ movement of vehicles across site.	- The movement of vehicles to and across the site should be controlled. Construction material required should be moved to where it is needed by means of wheelbarrows (when possible) instead of trucks thereby minimizing the impact on the soil. - For the safety of the homestead residents and immediate community members who utilize the existing access path, the contractors should create safer routes to be used by the road construction vehicles only and avoid the existing community paths.	- Daily visual inspection and monitoring by Contractor.	Contractor ESO	Included in Bid price
Biodiversity (fauna and flora)	The illegal hunting of wildlife in the area may affect the biodiversity in the area and surroundings	- Refrain from disturbing or killing wildlife found on and around the project sites. - Breeding sites for animals and birds occurring on and around the project pipeline route should not be destroyed nor disturbed. - Pipeline trenches should be secured (temporary fencing/ covering) and backfilled and capped after sampling is completed to prevent animals from falling into trenches. - Incorporate Environmental awareness and biodiversity preservation into the employment contracts of all workers.	- Inspection of the site rote by the ESO - Reporting of illegal poaching to the Police	Contractor ESO	Included in Project Cost
	The uncontrolled or unauthorized removal trees, especially	- Avoid unnecessary removal of vegetation to promote a balance between biodiversity and the project.	- Inspection of the site by the ESO	Contractor ESO	Included in Project Cost

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
	protected tree species may lead to that species in the area	- Vegetation found on the site, but within the footprint of the infrastructure route or access route should be left undisturbed/avoided. - Barricading tape (to indicate working areas) should be established. - Vehicle movement should be restricted to existing roads and tracks to prevent unnecessary damage to the surrounding vegetation. - No onsite vegetation should be cut or used for firewood. - Access roads should be created in a manner that disturbs minimal vegetation. - Environmental awareness on faunal and floral biodiversity preservation should be provided to the workers and contractors. This should be incorporated into the workers' contracts. - Clearing of protected tree species should obtain permit first, tress should be replanted somewhere in the areas. Implement a re-vegetation plan after project construction activities.			
Vehicular movements	Irresponsible driving and operations on/around sites	- Project goods, materials and services should be delivered to site once to twice a week, maximum. - Operators of the vehicles and machinery should be in possession of valid and appropriate driving/operating licenses and adhere to the road safety rules. - The site speed limit should be slowly (40km/hour or less) and be on the lookout for people (children, especially) and animals. - The site access roads should be equipped with temporary clear, and visible road signs. - All vehicles should be road worthy and serviced regularly to avoid accidents owing to mechanical faults of vehicles.	- Inspection of the site	Contractor ESO	Included in Bid price

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- No vehicle driver or machine operator should be allowed to operate vehicles/machinery while under the influence of alcohol or drugs. - Vehicles should be parked within the demarcated areas for such purpose onsite. - Site deliveries from and to site should be done during weekdays and between the hours of 8am and 5pm.			
Dust Generation	Dust from movement of heavy vehicles and earthworks mostly excavation for the pipelines and water infrastructure installation.	- Vehicles should not be driven at a speed more than 40 km/h to avoid dust generation in the project area mostly in gravel roads. - At dust sources onsite, a reasonable amount of water should be used by using regular water sprays to suppress the dust that may be emanating from such sites. - Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers on site excavation-based areas, where they are exposed to dust as well as heavy machinery operators. - Machines, and vehicles should be regularly maintained to ensure efficiency and reduce dust generation and harmful gaseous emissions.	- Inspection of the site	Contractor ESO	Included in Project Cost
Accidental disturbance of archaeological or heritage objects	Inadvertent destruction or disturbance of archaeological resources during site clearing and earthworks	- Upon discovery or unearthing of archaeological materials or human burials or skeletal remains, the work in the immediate area should be halted, the finds would need to be reported to the NHC may require inspection by an Archaeologist. The ESO should have the area fenced off and contact NHC (Tel: +264 61 244 375), National Forensic Laboratory (+264 61 240 461) immediately.	- Inspection of the site during site clearing and earthworks.	Contractor ESO	Included in Project Cost

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Buffer zones of 1km from any significant archaeological, historical or cultural heritage sites or finds should be maintained around. This includes graves, stratigraphic profiles, or past human dwellings, and areas with cultural significance. These can be a demarcation by fencing off or avoiding the site completely by not working closely or near the known site. - Direct damage to archaeological or heritage sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued. - All accidental discoveries shall be reported immediately to an archaeologist/heritage practitioner so that an investigation and evaluation of the finds can be made, acting upon advice the ECO / EC will advise the necessary actions to be taken; - Any pile of stones or mound of the earth looking even remotely like a grave should be avoided at all costs (this could be a grave). - Cognizance must be taken of the larger historical landscape of the area to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage or archaeological resources be exposed or uncovered during the project activities, these should immediately be reported to the heritage specialist or heritage authority (NHC). - The Proponent and Contractors should adhere to the provisions of Section 55 of the National Heritage Act in the event significant heritage and cultural features are discovered in the course of developmental works.			
Water Conservation					

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Irresponsible use of water.	Water wastage due to careless practices during construction.	- Groundwater abstraction and use permit should be applied for from the MAWLR prior to boreholes drilling and water abstraction, respectively. - Establish a water plan which, should include at least the following: a. A description of: the source of the water, where and how the water will be stored, and how the water will be distributed/utilised. b. Describe measures that will be taken to conserve water at each of the above-mentioned phases. c. Educate the work force on sustainable and effective use of water, e.g. clean equipment in containers. d. No member of the construction team is allowed to wash clothes or vehicles on the construction site.	- Daily inspections and condition reports.	Contractor ESO	
Water usage	Leaks from tanks and taps.	- Water should be used sparingly throughout the construction duration. It is the responsibility of the site coordinator to ensure that water conservation is strictly enforced.	-Daily inspections and condition reports.	Contractor ESO	
		- Water tanks / taps must be fixed. The water tank or taps must have water meters and be accessible to visual inspection. All faulty and leaking taps and pipes shall be immediately repaired.	-Daily inspections and condition reports.	Contractor ESO	
Groundwater contamination.	Refuse, garbage, cement, concrete, chemicals, fuels, oils or any other objectionable or undesirable material.	- Accidental spills must be cleaned immediately to avoid the pollution of the wetland, and ground water, since the soil around the site is highly permeable. - No member of the construction team is allowed to wash clothes or vehicles on the construction site.	-Inspection daily, reporting, and regular clean up.	Contractor ESO	
Conservation of Vegetation					

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Loss of biodiversity	Clearing of vegetation (removal of trees, etc.).	- The area to be constructed on the site, as well as lay-down areas, access routes, etc. should be clearly demarcated. The workforce must be instructed to operate within these boundaries. Any activity resulting in the chopping down of trees or removal of vegetation without the required authorisation is strictly prohibited. - All protected tree species should be tagged so that they are visible during construction works.	-Regular review of photographic records. Take photographs before construction starts as a record. -Monitoring by the ESO	Contractor ESO	
	Planting of alien vegetation.	- No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason. - At the end of construction all alien vegetation that has established should be eradicated.	- Regular inspection of site vegetation by the ESO.	Contractor ESO	
Waste Management					
Construction waste.	Incorrect or infrequent disposal of building rubble.	- Construction waste should be stored in skips and should regularly be removed off the site for disposal at an applicable municipal waste disposal site.	- Regular inspection on site.	Contractor ESO	
	Construction waste blown by wind (e.g., cement bags).	- Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste.	- Daily inspection and clean up.	Contractor ESO	
Increased general waste.	Domestic waste from construction team.	- Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. - The various waste types shall be disposed of at appropriate municipal and recycling facilities. - Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. - Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility.	- Daily inspection and clean up.	Contractor ESO	

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Domestic waste.	Domestic waste from construction team.	- The workforce must be sensitised to dispose of waste in a responsible manner and not to litter, not at the construction site and not at the campsite. - Sufficient waste bins should be supplied. - No waste should be burned nor buried onsite.	- Daily inspection and clean up.	Contractor ESO	
		- Domestic waste which cannot be recycled should be stored in a skip and removed via truck once a week.	-Regular inspection.	Contractor ESO	
Hazardous waste.	Accidental / negligent spillages from equipment working on site.	- Spillages of any potentially toxic materials, whether by accident or through negligence, must be scooped up immediately into drums. - All waste hydrocarbon material should be collected and stored in appropriate containers and transported off-site to a suitably qualified third party which routinely handles such waste).	- Daily inspection and clean up.	Contractor ESO	
	Storage of hazardous materials.	- Oil sludge, oily rags, contaminated spill clean-up materials, contaminated soils and other hazardous materials waste must be kept off-site or in a dedicated separate container on site. These containers must be locked and only accessible by the site foreman. Wesco Group should be approached to collect these wastes periodically or as needed.	- Daily inspection and clean up.	Contractor ESO	
Ablution waste.	Construction team.	- Only portable chemical toilets should be used on site and at the campsite. Under no circumstances may the waste from these toilets be dumped in the veld. The waste should be removed at least once a week to the nearest municipal sewage site. Alternatively, it may be pumped out into sealable containers and stored until it can be removed by truck. If stored, the containers should be kept out of direct sunlight and should not be stored for longer than a month. People responsible for cleaning these toilets should be provided with latex gloves and masks.	- Daily inspections and clean-up.	Contractor ESO	

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
		- Spillage or leakage to be cleaned-up and fixed immediately.			
Dust Control					
Dust generation and harmful gas emissions	Dust proliferation due to fines content of soil as well as harmful gas emissions or fumes form vehicles and machinery may compromise air quality in the project areas	- Soil stacks should be placed downwind from the main activity areas and from the road detour. - All construction areas and soil stacks should be regularly wetted using regular water sprays on problematic dusty sites to suppress the dust that may be emanating from such construction areas onsite. - Project vehicles within the area should not be driven at a speed more than 40 km/h to avoid dust generation. - Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers onsite where they are exposed to dust. - Excavating equipment should be regularly maintained to ensure excavation efficiency and so to reduce dust generation and harmful gaseous emissions. - Vehicles and machinery that are not in use should not be left idling nor unattended. Therefore, they should be turned off.	- Visual monitoring for dust nuisance and safety	Contractor ESO	
Noise Control					
Noise generation.	Noise from vehicles and construction activities.	- Inform communities the schedules for operation of heavy noise machinery. - All machinery should be calibrated and maintained regularly. - No construction activities should be done during night-time hours, i.e., between 18h00 to 07h00 and over weekends. - Construction hours should be restricted to between 07h30 and 17h00 to avoid noise generated by construction equipment and the movement of vehicles before or after hours	- Daily monitoring. - Complaints from neighbours. - Records of how these have been addressed.	Contractor ESO	

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs of activities (N$)
Community Health and Safety					
Community health and safety	Lack of safety and health measures in the community during construction may lead to minor and serious injuries	- Heavy vehicle, equipment and fuel storage site should be properly secured, fenced off and away from public exposure and access. - Trenches should be temporarily fenced off during sampling, and once completed, they should be backfilled thereafter. - An emergency preparedness plan should be compiled, and all personnel appropriately trained. - Ensure that goods and projected loads are securely fastened to vehicles to avoid falling and injure people or animal along the project route. - Warning signage should be erected at hazardous site areas such as open trenches. The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs clearly written in English and local languages (Oshiwambo).	- Daily monitoring. - Complaints from neighbours. - Records of how these have been addressed.	Contractor ESO	

9.8.3. Operations & Maintenance Phase Measures

The management and mitigation actions plan for this phase are presented in Table 24. It should be noted that some impacts occurring during the construction phase might be encountered during the operations and maintenance phase. Reference to respective impact under the construction phase will be done under such circumstances. The maintenance activities will be done internally by MAWLR, or they would choose to subcontract it to an external water infrastructure maintenance service provider.

Table 24: Operations and Maintenance Phase - Management and Mitigation Measures.

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
		Social Environment			

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
Conflict due to closed water supply as a result of unpaid bills or damaged infrastructure	- Communities dissatisfied with the water supply scheme services	- MAWLR should timely notify the communities of both foreseen and unforeseen circumstance of water supply issue. This will help the communities to make provisions for water supply during water supply interruptions duration. - Schedule annual community engagement and issues submissions meeting in each village. - A system for the on-going management of the communication between the Proponent and local communities, which should include: a means for lodging a complaint concerning maintenance activities, provision of feedback to the plaintiff from the maintenance team stating how the issue is being addressed, and report back on issues raised and how addressed from the maintenance team to the Project Manager / Proponent.	- Minutes of meetings - Communication Plan shared via constituency councillors' offices	Proponent / MAWLR through their regional representatives (officers)	O&M Costs Included in project design
Maintenance solid waste	Stockpiling materials on site.	- Stockpile materials such as bricks, sand, and stones in neat piles store sensitive materials such cement, hazardous materials, and consumables separately in a demarcated area on site. - Store only small amounts of materials on site to avoid unsupervised use that may lead to accidents and spills. - Stockpiles must be of a safe height of less than 2m high and 45° slope angle. - Protect all fluids containers from low temperatures to avoid leaks and pollution.	- Regular visual and records inspection by the Project Manager.	Proponent / MAWLR	O&M Costs Included in project design
Biophysical Environment					
Soil erosion and compaction	Unnecessary soil disturbance and excavations	Please refer to measures provided under the construction phase and implement accordingly.	- Daily inspection of the surface protection work - Daily monitoring and regular visual	Proponent / MAWLR	
Soil pollution	Garbage, cement, concrete, sewage,				

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
	chemicals, fuels, oils or any other objectionable or undesirable material.		inspection by contractor.		
	Soil pollution by fuel leaks		- Daily monitoring and regular visual inspection by the maintenance team	Proponent / MAWLR	
	Heavy vehicles/ movement of vehicles across site.				
Dust Generation	Dust from movement of heavy vehicles for maintenance and excavations/ earthworks done to repair the water supply line.	Please refer to measures provided under the construction phase.	- Inspection of the site	Proponent / MAWLR	
Accidental disturbance of archaeological or heritage objects	Inadvertent destruction or disturbance of archaeological resources during site clearing and earthworks	Please refer to measures provided under the construction phase.	-Inspection of the site during earthworks	Proponent / MAWLR	O&M Costs Included in project design
Water Conservation					
Water usage	Excessive water and unsustainable water use practices.	- Constantly monitor water usage of the communities if the water is used for domestic and livestock purposes which is the aim of this project.	- Monthly inspections and condition reports.	Proponent / MAWLR	

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
	Leaks from the reservoirs, pipeline, tanks and taps.	- Water conservation should be strictly enforced. - Inspections at the pipeline, reservoirs, and taps should be done on a monthly basis to ensure that there are no damages and leaks that may result in water wastage and eventual high-water bills for the communities. - Damaged water tanks / taps must be fixed. The water tank or taps must have water meters and be accessible to visual inspection. All faulty and leaking taps and pipes shall be immediately repaired.	- Monthly inspections of the supply line and produce condition reports.	Proponent / MAWLR	O&M Costs Included in project design
Non-revenue water	Poor maintenance of the pipeline that result in high leakages thus increasing non-revenue water which burdens the water users and utility provider.	- Timely repair of the pipeline. - Constant monitoring of the leakage of the main pipeline. - Encourage communities to report leakages. - Set-up contact number and procedure for communities to report leakages.	- Constant inspection and maintenance of the water supply lines.	Proponent / MAWLR	O&M Costs Included in project design
Conservation of Vegetation					
Loss of biodiversity	Clearing of vegetation (removal of trees, etc.).	- Any activity resulting in the chopping down of trees or removal of vegetation without the required authorisation is strictly prohibited.	- Regular review of photographic records. Take photographs before maintenance starts as a record.	Proponent / MAWLR	
	Planting of alien vegetation.	- No alien vegetation may be introduced to the site in the form of seeds or plants, for beautification or any other reason.	- Regular inspection of site vegetation	Proponent / MAWLR	
Waste Management					

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
Maintenance waste	Incorrect or infrequent disposal of maintenance rubble.	- Maintenance waste should be stored in skips and should be removed off the site for disposal at an applicable municipal waste disposal site.	- Regular inspection on site.	Proponent / MAWLR	O&M Costs Included in project design
	Maintenance waste blown by wind (e.g., cement bags).	- Empty cement bags, plastics, wrapping waste, strapping, etc. to be secured in containers for general waste to prevent wind-blown waste.	- Daily inspection and clean up.	Proponent / MAWLR	
Increased general waste.	Domestic waste generated by the maintenance team.	- Waste shall be separated according to cardboard/paper materials, plastic, bottles and tins. - The various waste types shall be disposed of at appropriate municipal and recycling facilities after completion of maintenance activities. - Appropriate containers shall be placed on site for waste separation and the workforce trained sensitised accordingly. - Only the general waste, which cannot be recycled shall be disposed of at the municipal waste disposal facility.	- Daily inspection and clean up.	Proponent / MAWLR	O&M Costs Included in project design
Domestic waste.	Domestic waste from maintenance team.	- The workforce must be sensitised to dispose of waste in a responsible manner and not to litter in the area. - Sufficient waste bins should be supplied.	- Daily inspection and clean up.	Proponent / MAWLR	O&M Costs Included in project design
		- Domestic waste which cannot be recycled should be stored in a skip and removed or taken along to Outapi after maintenance works.	- Regular inspection.	Proponent / MAWLR	
Noise Control					
Noise generation.	Noise from vehicles and maintenance activities.	- All machinery should be calibrated and maintained regularly. - No maintenance activities should be done during night-time hours, i.e., between 18h00 to 07h00 and over weekends.	- Daily monitoring. - Complaints communities.	Proponent / MAWLR	

Environmental Impacts Requiring Mitigation	Sources of Impacts	Management and Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Estimated costs (N$)
			- Records of how these have been addressed.		
Community Health and Safety					
Community health and safety	Lack of safety and health measures in the community during maintenance may lead to minor and serious injuries	- If onsite, maintenance equipment and fuel storage site should be properly secured, fenced off and away from public exposure and access. - Maintenance trenches should be temporarily fenced off during sampling, and once completed, they should be backfilled thereafter. - An emergency preparedness plan should be compiled, and all personnel appropriately trained. - Ensure that goods and projected loads are securely fastened to vehicles to avoid falling and injure people or animal along the project route. - Warning signage should be erected at hazardous site areas such as open trenches. The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs clearly written in English and local languages (Oshiwambo).	- Daily monitoring. - Complaints from communities. - Records of how these have been addressed.	Proponent / MAWLR	O&M Costs Included in project design
Mishandling of chlorine	Health hazards towards the Operators	- Ensure proper storage and handling practices for chemicals. - Chemicals should be placed properly in an indoor warehouse, bunded, with no sun exposure and room temperature control and access limited to authorized personnel only. - Ensure the knowledgeable and skilled person oversees chlorine handling. - Provide training with simulation performances and equipment to improve worker on handling the Chlorine. - Ensure use of PPE while using chemicals	- Daily monitoring	NamWater	O&M Costs Included in project design

9.8.4. Decommissioning Phase Measures

The project infrastructure and services (mechanical and structural components) are anticipated to operate for about 30 to 50 years. The pump station facilities will likely be upgraded then continue operation as long as the communities in this part of Omusati Region continue to exist and population grow. Maintenance and upgrading may therefore be necessary to keep optimal functionality. After the lifespan is finished and/or no more upgrades are feasible, a decommissioning period will commence. The environmental and social impacts of decommissioning would reflect its operational history, the projected use of the site and the social and environmental conditions within the program area.

Inappropriate disposal of wastewater technology and biodigester equipment and infrastructure, may involve environmental harm. Recycling and disposal of waste will be done by a company with a license and experience in this type of decommissioning projects. The projected impacts and risks during this phase are expected to be limited in scope but may include:

- **Soil disturbance:** All drilled boreholes and excavated pits related to the project activities should be capped and backfilled, respectively. This will include the levelling of stockpiled topsoil soon after completion of works at affected/disturbed sites. Any temporary setup on site should be dismantled, and the area rehabilitated as far as practicable, to their original state.
- **Disturbance to traffic:** Notices should be sent on informing the communities and affected parties of the demolition or decommissioning period. This shall be done well in advance (30 days before). Effective communication of the process with affected persons is important.
- **Air pollution:** Monitor the air. To avoid eruption of dust, watering of the places where demolition is taking places is required.
- **Noise pollution:** Noise generated through dismantling infrastructure and equipment could potentially impact on workers and neighbourhood residents.
- **Occupational health and safety**: Workers involved in the decommissioning should be provided with proper PPE required of the job. They should also receive training on how to carry out this process.
- **Waste generation**: Decommissioning of infrastructure and equipment may cause excess material generation. Equipment such as piping, valving, pumps, instrumentation and control equipment, can have residual values and can be sold or relocated off-site for reuse. Where recycling options are possible these will be implemented prior to the last option of landfilling. Other waste such as lubricants, oils and greases must be treated as hazardous waste and disposed accordingly.

10. REHABILITATION AND MONITORING PLAN

Rehabilitation is the process of returning the land for a given area that has been disturbed by construction, operation and maintenance to an acceptable state or an otherwise predetermined state. The aim of the rehabilitation program provided in this report is to restore the project area to an acceptable standard as close to its baseline environmental state as possible. The objectives of the rehabilitation plan in this ESMP are to:

- Identify areas that must be rehabilitated to their natural state and areas that can be rehabilitated to a functional state,
- Provide a description of the procedures that should be followed for soil stabilisation and planting,
- Provide a framework for monitoring and reporting on the success of the rehabilitation exercise,
- Define roles and responsibilities for the implementation of this plan.

The objectives of the rehabilitation plan above should be based upon the specific characteristics of the construction area and should reflect:

- ✓ Legislative requirements in the area;
- ✓ Health and safety considerations;
- ✓ Environmental and social characteristics of surrounding area;
- ✓ Biodiversity in the area;
- ✓ Ecosystem services provided within the site's ecological boundaries;
- ✓ Post-closure land use plan.

Thus, the "4 R" Approach shall be employed for the rehabilitation of the disturbed environment in the project area. This includes:

- Restoration
- Rehabilitation
- Replacement / re-vegetation, and
- Reservation/conservation.

The success of rehabilitating the community/population within a designated area is dependent on the satisfactory establishment of the chosen plant species. To ensure that the process is optimised, the correct plant species in the correct densities and combinations should be utilised. Monitoring of the rehabilitation process is imperative to ensure that aggressive plant species and herbivores are controlled, and slopes remain stable. The general aim of a rehabilitation programme in this report is to recreate a natural ecosystem. The rehabilitation will therefore be outlined in three (3) phases, which are required, namely:

- Take measures to stabilise the soil and remedy the soil, when required, through the monitoring and management of the soil composition, pH levels, nutrients, etc.
- Re-vegetate disturbed areas using appropriate natural successional species.
- Monitor and manage the success of the rehabilitation by controlling aggressive indigenous plants, removing alien invasive plant species as soon as they are observed, and maintaining the re-vegetated areas to ensure the successful establishment of these re-vegetated areas.

The proposed Rehabilitation Plan for the project is applicable to the following areas:

- Areas near or bordering wetlands or water drainage channels that may have been disturbed but have not been developed,
- Road verges after temporary access roads construction is completed,
- Campsite areas when construction workers demobilize,
- Wetlands (if any disturbed in the project area),
- Stormwater soak away features and landscaped areas, and
- Areas where large patches of indigenous or invasive Alien Plant species have been removed.

Rehabilitation starts at the beginning of the project i.e., when clearing for construction begins and is not applied retrospectively. The steps outlined in the sections below must therefore be applied during the construction phase.

10.1. Rehabilitation Methods

10.1.1. Rehabilitation Phase 1: Soil Stabilisation and Remediation

Topsoil, which is removed during construction (trenching of the pipeline and construction of additional water infrastructure), must be utilised in the nursery and stored on site for rehabilitation and re-vegetation. Once construction is completed, the topsoil must be spread over the disturbed site and covered with mulch. Where necessary, the soil must be stabilised using suitable materials, such as netting or geotextiles. The plant material (grasses and herbs), which have been removed from the site, should be mixed into the topsoil to supplement the organic nutrient content of the soil. No further soil conditioning in terms of fertilising is deemed necessary at this stage.

10.1.2. Rehabilitation Phase 2: Re-Vegetation Procedure

The selection of species to be used for re-vegetation should be based on the ability of the species to successfully grow from the indigenous seeds, sods and/or slips which have been collected from the site. The revegetation procedures are attached hereto as Annexure 1 of the ESMP.

10.2. Rehabilitation Monitoring

As part of ensuring that the environment is returned to its pre-project activities state, the Executing Agency (through its Construction Contractors), rehabilitate the site areas and maintain a rehabilitation monitoring plan from the commencement date of rehabilitation activities. The monitoring of rehabilitation efforts will need to be continued for a period of 12 months after the rehabilitation procedure has been completed. In case of any arising issues, that have not been resolved through the implementation of the recommended measures, a suitably qualified botanist should be hired to provide further rehabilitation/remedial measures. The ECO should monitor the rehabilitation process and record the progress in the regular audit reports using photographic evidence. The rehabilitation should include monitoring the establishment success (presence, percentage cover or absence) of plant cover and species composition per rehabilitated area. Monitoring must be undertaken biannually throughout the project cycle.

The success of the rehabilitation program measured on primary grass cover fully established, and there is no further requirement for frequent monitoring and management of the vegetation growth.

MAWLR will ensure that the Rehabilitation Plan is reviewed for efficacy, and any necessary changes thereto will be reflected in the periodic revisions of this document. A summary of all rehabilitation monitoring activities and outcomes will need to be reported on in the biannual reports.

10.3. ESMP Monitoring and Evaluation

The environmental and social aspects to be monitored throughout the project implementation phases are provided in Table 25. Monitoring ensures that mitigation measures are implemented effectively. Monitoring activities will be done on two levels:

a. **Compliance monitoring** – this will check whether the actions proposed in the ESMP have been carried out through visual observation, photographic documentation and the use of checklist prepared in the ESMP. MAWLR as the executing agency should take lead in this monitoring to enforce compliance of the ESMP by contractors involved in different phases of project implementation.
b. **Effects monitoring** – records the consequences of project activities on the biophysical and social environment; as applicable, these effects are repeatedly measured by applying selected indicators. Contractors appointed by MAWLR should take lead in this monitoring and MAWLR will play an oversight role.

This ESMP recommends the monitoring of the RSWSP Phase 1 activities to be done in two parts: internal and external monitoring.

a. Internal monitoring

This would be applied to various aspects of the ESMP, including:

i. The project activities' screening procedure (to make sure it operates successfully and effectively).
ii. Environmental and social monitoring of the RSWSP Phase 1 project implementation in terms of changes to baseline conditions, adherence to necessary protection and compensatory measures, and recommendations made by environmental and social studies conducted for the project such as ESIA, environmental or social impacts, to ensure that they do not exceed expected limits.
iii. Ensuring that all necessary safeguards have been properly put in place, assessing the effectiveness of mitigation measures, and suggesting additional mitigation measures as necessary to control impacts.
iv. The implementation of capacity-building and training.

b. External monitoring

This should be done separately and regularly as as part of a periodic review of the project's overall progress. External monitoring should be done by the regulating authority through the reports submitted by independent environmental consultant or through random visits by the regulating authority.

10.3.1. Areas to be monitored.

The areas to be monitored must be precisely mapped before monitoring begins. This helps by providing details on where to watch, when to watch, how, what tools to use, what units of measurement, and who enforce compliance and checks. As listed below, the following areas will be taken into consideration for monitoring:

- Ambient air quality
- Chemical pollution
- Loss of natural and cultural heritage
- Marginal lands/fragile ecosystems
- Noise and Vibrations
- Socio-Cultural Issues
- Soils
- Vegetation
- Water resources and use (including pipeline to ensure non-revenue water is under control)
- Wildlife (if any in the project area and surrounding environment – region)

The mitigation measures of the monitoring plan including whose responsibility is are provided in Table 25

Table 25: Environmental and Social Aspects to be monitored during construction and operational phase.

Potential impact	Mitigation / Enhancement Measure (s)	Responsible Party	Indicator (S)	Monitoring Frequency	Monitoring Agent
Domestic solidwaste generated by workers	- Provide bins for waste collection, especially at contractors' camp sites; - Dispose of domestic waste generated at the nearest designated waste disposal site.	Contractor	Amount and type of waste generated.	Weekly	MEFT
Soil contamination or pollution from hazardous chemicals orproducts such as petroleum products e.g. oil and fuel, brine and watertreatment chemicals aswell as wastewater from toilets.	- Prevent spillages of any chemicals and petroleum products (i.e., oils, lubricants, petrol and diesel): - Use drip trays, linings or concrete floors when evidence of leaks is observed on vehicles or equipment; - All fueling, storage and chemical handling should be conducted on surfaces provided for this purpose. - No major servicing and maintenance of vehicles and/or equipment should be conducted onsite; - Drip trays, linings or concrete floors must be used when removing oil from machinery; - Spillage control procedures must be in place according to National Oil Spill Contingency Plan - Wastewater collection systems should be connected to these systems; - Should portable toilet facilities be necessary, adequate containment systems should be erected at the site for use during the decommissioning phase; - Wastewater should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed of at a suitable sewage disposal site; - Run-off from toilets due to overflows should be avoided at all costs; - Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.	Contractor	Observations and soil tests (Hydrocarbons)	Daily or weekly observations.	MEFT, MAWLR
Noise generated from dismantling of infrastructure	- Check for faults when equipment is noisy; - Turn off machinery and equipment when not in use. - Ensure regular maintenance of machinery and vehicles. - Ear plugs must be used when working in noisy areas	Contractor	Allowable noise Exposure in decibels: 85 dBA as an 8-hour Time Weighted Average)	Monthly	Ministry of Labour, Industrial Relation and Employment Creation (MLIREC)
Disruption of water supply - Switching / cutting off water supply.	- Communicate and warn stakeholders of the planned maintenance resulting in water cuts. - If decommissioning, an alternative water supply system should be commissioned before water supply is halted.	Contractor and / or MAWLR Omusati Region	Number of announcements (water cuts)	Monthly	MAWLR

Potential impact	Mitigation / Enhancement Measure (s)	Responsible Party	Indicator (S)	Monitoring Frequency	Monitoring Agent
Occupation health and safety (Injuries due to onsite accidents)	- Provision of appropriate personal protective equipment such as gloves, goggles, masks and clothes; - Provision of first aid kits and equipment; - All visitors to report to the Scheme Officer on duty and be inducted / guided through the site with appropriate personal protective equipment; - First aid and safety awareness training for employees; - The employees must be properly trained on safety and health issues of the removal of old equipment. - All sites must be fenced off and fences maintained intact to prevent access to unauthorised persons or stray livestock from entering.	Contractor	Lost time cases rate, calculated by the multiplying the number incidents that were lost time cases by 200 000 and then dividing that by the employee labour hours at the company.	Monthly	Ministry of Labour, Industrial Relation and Employment Creation (MLIREC)
Air pollution	- Soil or ground excavation works should be done when wind is calm. - Use water to suppress dust when breaking up concrete stands and slabs. - Dampen surfaces with water during work. - Protect stockpiled soil with cover materials such as nets to protect loose soil from being blown away by the wind. - It must be ensured that all vehicles entering the site and machinery used in construction activities are in good working order to prevent unnecessary emissions. - Trucks transporting sand should be covered by tarpaulin.	Contractor	Dust count	Monthly	MEFT
Road traffic flow disturbances leading to accidents.	- Drive during day only for project related vehicular movements. - Adhere to speed limits on the national roads; - Adhere to speed limits on construction sites: 30 km per hour for construction vehicles and 40 km per hour for light and passenger vehicles. - Receive deliveries during day. - Mark all construction vehicles as required. - Make use of legible bright colours for signage.	Contractor	Number of motor vehicles accidents	Monthly	MEFT
Excess material which may become waste	- construction rubble should be disposed at a registered building waste material landfill; - Recyclable materials should be segregated and send to recycling enterprises; - Reusable equipment such as pipes, valves, motors can be relocated and auctioned to the public for reuse.	Contractor and Superintendent	Type and quantity of waste	Monthly	MEFT

10.4. Community and Stakeholder engagement

Adding to the stakeholder consultation detailed in the ESIA, consultation is and should be an ongoing process and forms part of the life cycle of the project. For that, the following measures are proposed:

- Conduct stakeholders' meetings as and when needed, to ensure that the people in the community and stakeholders continue to be informed during construction and, where required, during operation and decommissioning phases. The consultation meetings held during the environmental scoping phase marked the beginning of the early engagement with stakeholders.

10.4.1. Grievance Redressal Mechanism (GRM)

To receive and facilitate the resolution of affected persons, complements and grievances about the project's environmental and social performance, an Environmental Grievance Redressal Mechanism shall be established for the project. The GRM ensures transparency of the project activities and that voices of the least and marginalised affected by the project activities are heard. The GRM shall be implemented throughout the project phases to afford opportunities to all the stakeholders, particularly those affected by the project to open their views on the project. A two-way communication from the lowest level to the top and vice-versa is recommended to ensure that the GRM is effective, and that information and solutions cascades down to the affected stakeholders. The proposed GRM is consistent with the requirements of AfDB safeguards.

10.4.2. Objectives of GRM

To enable the affected persons to openly communicate their grievances, the objective of the proposed GRM channels will be to:

- Clarifying the nature of the grievance
- Investigating the reasons for dissatisfaction
- Obtaining, where possible, a speedy resolution to the problem
- Taking appropriate actions and ensure that promises are kept.

10.4.3. Grievance processes and procedure

Grievances will be handled by the project Executing Agency - MAWLR's DWSSC through the Omusati Regional Council's respective constituency office and will include the following steps and timelines:

- Provide a grievance registration form triplicate book onsite,
- Provide a grievance form to the concerned party or stakeholder to complete (personal details and details of the grievance) and submit one copy to MAWLR (DWSSC) and another copy to the Regional Council, one copy remains onsite,
- Open discussion of the issue by project team and executing agency to formulate resolution(s),
- Provide for communication of the resolution to the concerned stakeholder(s), and
- Provide for an appeal process if the stakeholder is not satisfied with the proposed resolution of the complaint.

If the stakeholder is still unsatisfied, it is the responsibility of the MAWLR's Area Officer to advise the aggrieved party of their right to legal recourse by the Project Manager. Anonymous grievances can be raised and

addressed. The grievance registration form is attached at the end of this report as Annexure 2. Several uptake channels to consider include:

- Walk-ins at focal points such as the Contractor's site office and MAWLR's office
- Short message services (SMSs) – this can be anonymously sent SMS with village or area name and grievance type.
- Clearly hand-written letters of complaints (containing name of the complainants (if comfortable or can remain anonymous), date of complaint, village/area, nature of complaint, and contact details).
- Emails (for those with email addresses and have access to internet)
- Telephone calls

Once an issue is received it must be recorded and resolved within a specified time period. All issues should be reported on and followed up during monthly progress meetings. More importantly, this GRM should be communicated to the potential affected persons or communities where project activities will be taking place.

10.4.4. Grievance handling procedures

The grievance handling procedures that shall be followed is presented in Figure 15. During the ESIA the grievances and / or concerns can be communicated to the implementing agency, but contractor should open grievance reporting framework to be implemented on site.

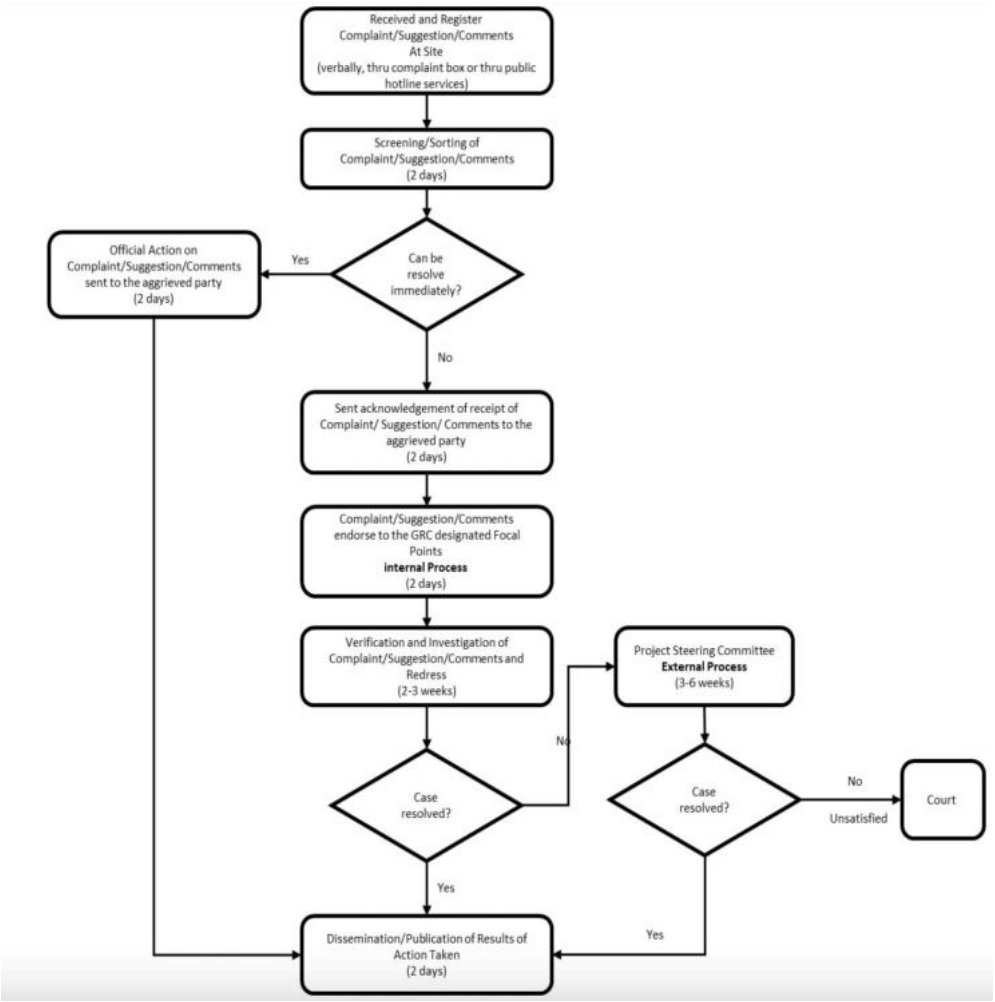


Figure 15: **Proposed g**rievance redressal mechanism process flow **for the project activities**.

10.4.5. Estimated costs/budget for ESMP implementation.

The estimated annual budget (N$425 000.00) provided in Table **26** is for administrative costs of ESMP implementation by the executing agency. These includes training and awareness programs to the responsible for ESMP implementation monitoring by the executing agency, outreach programs to the communities for sensitization on the environmental and social issues in the ESMP. The actual costs for implementing specific corrective and mitigation measures are provided in different sections of the ESMP (Table **22**Table **23** andTable 24). These shall be costed by contractors as they will have better, and detailed costing information based on the technology and methods going to be used to implement the measures. This should be included in the bidding documents clearly written costs for implementing corrective measures in the project ESMP (thus, the ESMP should be made available to the interested bidders). The executing entity (Ministry of Agriculture, NamWater) should check for this at bidding and will be responsible for enforcing. This should be used as one criterion to select appropriate construction bids.

Table 26: Estimated administrative annual costs ESMP implementation annual budget for the Project.

Impact / activity	Estimated Cost (NAD)
Awareness training and awareness campaigns	
Development of training and awareness materials master copies	75,000.00
Facilitation of training and capacity building (outsourcing independent consultant)	250,000.00
Awareness through outreach programme to the communities where project is implemented on environmental and social issues in the ESMP.	100,000.00
Total annual cost	***425,000.00***

10.5. Conclusions

The ESMP has been developed to manage (corrective measures), mitigate (avoid or reduce) the potential adverse (negative impacts) associated with the proposed project activities. Project costing including the tender bidding should include this ESMP to ensure that funds are made available to implement corrective and mitigation measures proposed in this report. Thus, the ESMP should be made available to all the potential bidders so that the costs of implementing these measures are properly accounted for at bidding stage.

These impacts ranges from impacts on land use change (aesthetic value) impact, physical soil disturbance, fauna and flora (biodiversity), water resources (abstraction and pollution), environmental health (pollution/littering), culture, heritage and archaeological, occupational and community health and safety risks/hazards, property displacement, air quality and vehicular traffic safety, as well as climate change.

As described in the ESSR, these impacts are site-specific and would be minimized by effectively implementing appropriate management and mitigation measures complemented by implementing the monitoring plan in the ESMP. Therefore, this ESMP should be used as an on-site implementation framework during all phases of the project: pre-construction (planning & design stage); construction; operation; and decommissioning phases of the project. MAWLR and all contracted third parties have the overall responsibility for ESMP implementation,

continuously monitoring and auditing of all activities during different phases of project development. This is to ensure that the ESMP is fully implemented and comply with the national regulations and AfDB safeguards requirements.

Therefore, D&P Environmental Consultants concludes that the proposed project can be granted an ECC (at national level), on condition that:

- All the management (corrective) and mitigation measures provided in the ESMP are effectively and progressively implemented and thoroughly monitored.
- All required permits, licenses and approvals for the proposed activities are obtained when necessary. These include permits and licenses for land use agreements (consents – if any need arise), services provision agreements (water and power provision) are obtained to ensure compliance with these specific legal requirements.
- Transparency in communication and continued engagement with stakeholders and communities and or through their leaders (such as the traditional authorities) throughout the project phases.
- The Grievances brought to the Contractors and MAWLR should be resolved/addressed amicably to the satisfaction of the communities, and or other stakeholders.
- The Executing Entity (MAWLR), or contractors (and subcontractors) comply with the legal requirements governing the project activities and ensure that project activities that require permits and or approvals are obtained and renewed as stipulated by the issuing authorities.
- Project site area particularly where trenching (excavations) is done should be backfilled (stockpiled topsoil levelled), and rehabilitated, as far as practicable.
- The ESMP implementation should be checked and done by the responsible personnel from both contractors and Executing Agency (Environmental Control Officers). The process should be audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (Audit) Reports. These reports are to be submitted to the Environmental Commissioner.

ANNEXURE 1: REHABILITATION PROCEDURES BY REVEGETATION (EDITED ACCORDING TO OUTRUN CONSULTANT REPORT, 2022)

Aspect of Rehabilitation	Rehabilitation Procedure
Land preparation	The target area should be prepared as follows: - Prior to rehabilitation of the site, all remnants of foreign debris / liter should be removed from the site. Compacted soil should be ripped toa depth of more than 250 mm to allow easy root establishment. - The final prepared surface should not be smooth but furrowed to follow the natural contours of the land. - All target areas must be covered with topsoil. Topsoil should be manually spread evenly over the surface. Topsoil must be spread tothe original depth and deeper where sufficient topsoil is available. - Sites where concrete slabs are to be thrown must first have 20cm of the topsoil removed for later use in the rehabilitation programme. - All the targeted areas should be mulched. The vegetation stripped and stockpiled during site preparation must be spread in a single layer across the target areas as mulch. - All revegetation target areas should be treated with nitrogen-fixing bacteria which is important for legumes, *Trichoderma* sp. and mycorrhizal products as a natural form of soil remediation.
Plant preparation	Plants should undergo a period of 'hardening-off' during which they have been exposed to full, direct sunlight and been under a reduced watering regime. The individual plants destined for each target site should be groupedinto site-specific, marked containers, before they leave the nursery. Each plant should be labelled with an aluminum label, giving species code, and a specific numeral identifying the site. Before planting commences, the equipment necessary for the proper handling and placing of all required materials must be on hand, in good condition and to acceptable approved standards. - Planting should preferably be done during the rainy season (summer). - Excavate square holes of approximately 800 mm x 800 mm x 800 mm for trees and approximately 500 mm x 500 mm x 500 mm for shrubs. - Backfill planting holes with excavated material/approved topsoil, thoroughly mixed with weed-free manure or compost (per volume, approximately one quarter of the plant hole), one cup of 2:3:2 fertiliser and an approved ant and termite poison (if required). - As much of the soil from container plants as possible must be retained around the roots of the plant during planting. - The soil must cover all the roots and be gently pressed down to a level equal to that of the surrounding in situ material.

Aspect of Rehabilitation	Rehabilitation Procedure
	- After planting, each plant must be well watered and additional soil should be added once the soil has settled, if necessary. - Mulch must be added to the surface area of the topsoil in order to sustain soil moisture. - Stake all trees using at least three (3) weather resistant wooden or steel stakes anchored firmly into the ground. Two (2) of the three (3) stakes should be located on the windward side of the plant. Galvanised wire binding, 3 mm thick, covered with a 20 mm diameter plastic hosepipe must be tied tightly to the stakes, half- to two thirds the height of the tree above the ground and looped around the trunk of the tree. - Place stakes at least 500 mm apart and away from the stem and roots of the tree, so as not to damage the tree or its roots. - Thoroughly water plants as required until the plants are able to survive independently, i.e. until they are able to survive when receiving water from rainfall only. - A raised circular 200 mm high subsoil berm placed 500 mm (shrubs) to 750 mm (trees) from the plant stem must be provided for the watering. Do not simply leave the excavated plant hole partially backfilled for this purpose, the berm must be raised above the natural soil level. - Water aloes and bulbs once directly after transplanting to settle the soil. - Remove stakes and wire binds over time as required, as plants become established.
Grassing using sods	"Sodding" is defined as the laying of grass sods. - Sodding may be done at any time of the year. - The soil should be uniformly wet to a depth of at least 150 mm beforegrass sods are planted. - Protect sods against drying out by keeping them moist from the timeof harvesting until final placement. - Rake or spike the area to create a loose surface to a depth ofapproximately 100 mm. - Lay two (2) rows of sods in a straight line or following a contour,starting at the bottom of a slope (if not flat), where possible. - Place the next two (2) rows of sods in the same direction, 5 m away, until the full area is covered with rows of sods. - Tightly push sods together, taking care not to stretch or overlap sods. - Where a good fit cannot be obtained, the intervening spaces shouldbe filled with parts of sods or topsoil. - After planting, water sods to prevent drying out. - Irrigate as required until the grass is able to survive independently, i.e. until it is able to survive when receiving water from rainfall only.

Aspect of Rehabilitation	Rehabilitation Procedure
Grassing using runners	- Plant grass runners evenly by hand or by mechanical means at a rate of at least 400 runners per hectare (i.e. at 250 mm centres). - Only use fresh runners, avoiding grass runners which have dried out. - Rake or spike the area to create a loose surface to a depth of approximately 100 mm. - The soil should be uniformly wet to a depth of at least 150 mm before planting of grass runners. - After planting, the runners must be given copious amounts of water and, when sufficiently dry, must be rolled with a light agricultural roller and re-watered. - Irrigate as required until the grass is able to survive independently, i.e. until it is able to survive when receiving water from rainfall only.
Grassing using seeds	- All seed should be collected from the site during vegetation clearing or from the neighbouring veld. - Seeding must be done during the summer months, when the germination rate is better. - Seeds must be sown at the rate of 0,5kg per 100m2 (50kg per hectare). - The soil should be loose and uniformly wet to a depth of at least 30 cm, before any seeding commences. - Halve the seed and fertiliser mixture as specified and apply evenly in two (2) successive applications perpendicular to each other. - The seeded area must be raked over after seed application and well watered. - Irrigate as required until the grass is able to survive independently, i.e. until it is able to survive when receiving water from rainfall only.
Maintenance	- Cordon-off areas which are under rehabilitation as temporary no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced-off to prevent vehicular, pedestrian and livestock access. - Re-vegetation of the ridges must be the same as the vegetation type which previously existed. - Water all transplanted, planted and grassed areas as specified. - Watering must commence and continue immediately after the seeds have germinated and growth begins. - Mow lawns regularly to a height of 50 mm above ground level. This promotes adequate coverage. - Mowing of veld grass is to take place once a year after the grass has shed its seed and not before the grass has fully grown - fire breaks are important. - Check all plants for pests and diseases on a regular basis and treat the plants, when required, using approved methods and products as per the manufacturers' specifications. - Control weeds by means of extraction, cutting or other approved methods. - In planted areas which have failed to establish, replace plants with the same species as originally specified. The same species

Aspect of Rehabilitation	Rehabilitation Procedure
	must be used unless otherwise specified by the ECO. - A minimum grass cover of approximately 80% is required. Individual plants must be strong and healthy growers by the end of the maintenance period. - Acceptable cover, in the case of sodding, is attaining 100% cover by the specified vegetation.

ANNEXURE 2: GRIEVANCE REDRESSAL FORM

GRIEVANCE REGISTRATION FORM

RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1: UPGRADE OF RURAL WATER SUPPLY PROJECT IN THE OMUSATI REGION

PLEASE COMPLETE THIS FORM IN DETAIL AND RETURN TO ANY OF THE FOLLOWING INSTITUTIONS EASILY ACCESSIBLE:

MAWLR Office (during construction and operational phase) and Contractor (Construction Foreman onsite / Site Foreman during construction).

Date: …… Name & Surname of Complainant: ……

Postal / Residential Address: …… Email address (if any): ……..……..

Town / Village: ……..…… Phone Number: ……. ……..

Subject of grievance: ……

Grievance Description: ……
……..

Date of receipt / acknowledge: ……Complainant Reference Number: ……..……..

Expected time of redressal: .....……..……

If time not met:
Reason for delay of redressal……

Action to be taken: ……..……

Updated time of redressal: ……..……...

Final redressal: ……..……

Type of Action taken……

If Complainant is not satisfied advise on pathway to pursue the matter

SIGNATURE (s):

Complainant: ……..Grievance Committee Chairperson: ……

Date: ……..……..……..……..……. Date: ……..……..……..……..……..……..……..……..……

11. LIST OF APPENDICES

APPENDIX A: FLORA AND FAUNA ASSESSMENT REPORT.

APPENDIX B: ARCHAEOLOGICAL & HERITAGE IMPACT ASSESSMENT REPORT.

APPENDIX C: LIST OF STAKEHOLDERS / INTERESTED AND AFFECTED PARTIES (I&APS).

APPENDIX D: NEWSPAPER NOTICES TO I&APS.

APPENDIX E: STAKEHOLDER AND PUBLIC CONSULTATION MEETING MINUTES AND ATTENDANCE REGISTER.

APPENDIX F: OMUSATI REGIONAL COUNCIL CONSULTATION/ENGAGEMENT LETTER.

APPENDIX G: CV'S OF RESPONSIBLE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP).

12. APPENDIX C: LIST OF STAKEHOLDERS / INTERESTED AND AFFECTED PARTIES (I&APS).

Name and Surname	Institution / Location & Position (if known)	Telephone Number	Email Address
Evidence T. Kasinganeti	D&P Engineers and Environmental Consultants (DPE Consultants): Lead Environmental Assessment Practitioner	+264 81 3634 904	info@dpe.com.na
Ndjaleka Longeni	DPE Consultants	+264 81 2998 444	info@dpe.com.na
Kristian Shiwayu	DPE Consultants	+264 81 3959 104	info@dpe.com.na
Adiel Mudzanapabwe	DPE Consultants	+264 81 3468 492	info@dpe.com.na
Roland Mushi	DPE Consultants	+26485 333 2373	rolandmushi@gmail.com
Victor Slinger	MAWLR / DWSSC / NWSSP: Technical Advisor	+264811400086	slingervictor@gmail.com
Chimwanga Maseka	NWSSP	+26481 1432 835	Chimwanga maseka@mawlr.gov.na
Martha L. Hangula	MAWLR: Technical Assistant - Namibia Water Sector Support Program	+264814824850	Martha.Hangula@mawlr.gov.na hangulamarthal123@gmail.com
Tomas Shikwa	NamWater	264811221627	
Leena Shoomba	Onesi-ORC	+26481 585 8140	
Anna Amwaama	Onesi-ORC	+26481 255 5685	
Festus Petrus	Omusati Regional Council	+26481 278 9708	
Abisai Shaningwa	Omusati Regional Council	+26481 127 7510	anshaningwa@gmail.com
Joel Nekwaya	Omusati Regional Council	+26481 256 1018	jnekwaya@hotmail.com
Veronika Ekandjo	Omusati-Govermer	+26481 159 9051	vekandjo@omusatiog.gov.na
Salome Shilelo	Omusati Regional Council	+26481 251 7061	
Hertha.N Shimuningeni	Omusati Regional Council	+26481 638 9666	
Ervin Kamati	Omusati Regional Council	+26481 233 6426	ekamati@omusati.gov.na
MC Tjikumwa	AWSSC ORC	+26481 491 4440	mtjikumwa@gmail.com
Hilya Amukwelele	AWSSC ORC	+26481 330 4580	
Paavo Pl Hanai	DWSSC-OUTAPI	+26481 270 259	
Samuel K Phillipus	Omaenene	+26481 212 4676	
Navukauba Hosea	Omaenene	+26481 2219366	
Kedidingo Kamuhanga	Omaenene	+26481 297 9028	
Nangenda Paulus	Omaenene	+26481 4452 765	
Vaino Petrus	Omaenene	+26481 206 0026	

Daniel Kavanga	Omaenene	+26481 362 855	
Hilja.T Nangenda	Omaenene	+26481 6310 252	
Karolina Tjipuka	Omaenene	+26481 5620 804	
Hilya Mulamba	Omaenene	+26481 229 2105	
Eunike Munelwandi	Omaenene	+26481 723 9180	
Fransina Nghifikwa	Omaenene	+26481 206 4621	
Annaselest Hakae	Omaenene	+26481 220 3706	
Telesiana Handunae	Omaenene	+26481 312 8669	
Linus Johannes	Omaenene	+26481 481 1335	
Joseph Maulisiu	Omaenene	+26481 2341776	
Katale Launa	Omaenene		
Iileka Lenna	Omaenene	+26481 233 8503	
Kapayulu Selma	Omaenene		
J.M	Omaenene	+26481 438 1366	
Shilekela Frans	Omaenene	+26481 615 9551	
Ambandi.B	Omaenene	+26481 842 9131	
Tjilondeli hilya.M	Omaenene	+26481 751 6954	
Mbambi Johana	Omaenene	+26481 615 4678	
Kamati Nangombe	Omaenene		
Tjilanduia Secilia	Omaenene	+26481 251 1853	
Fransina Mulasa	Omaenene	+26481 279 6683	
Tjitulika Naloodhi	Omaenene		
Joel Tjimbula	Omaenene	+26481 473 0926	
Hosea Namukomba	Omaenene	+26481 221 9366	
Samuel.K Phillus	Omaenene	+26481 212 4676	
Annelly Mulamba	Omaenene	+26481 281 0885	
Tobias Halukonga	Omaenene	+26481 874 5566	
Petrus Olivia	Omaenene	+26481 553 0775	
Katombela Vistorina	Omaenene	+2681 819 6987	
David M	Okalwano	+26481 278 5767	

Frans Nangolo	Okalwano	+26481 207 3664	
Elizabeth Shuudifonya	Okapika	+26481 487 4934	
Johannes Thigenipo	Ohenhongo	+26481 553 2200	
Sakaria Shaanika	Okapika	+26481 690 0993	
Angelica Phillipus	Omtwewoholongo	+26481 721 4192	
Aina Timoteus	Omutwewoholongo	+26481 309 7188	
Pombili Tomas		+26481 795 0513	
Mugeyye Petrus	Okalwano	+26481 700 5593	
Shamyengauge Felix	Okalwano	+26481 407 3227	
Elia Shixwanda	Okapika	+26481 292 6697	
Andreas Visser	Omutsegwoholongo	+26481 644 6702	
Frieda Shikale	Ohenongo	+26485 788 1394	
Johannes Ndeshitila	Ohenongo	+26481 814 0014	
Ihula.T	Okapika	+26481 346 6709	
Johannes. D	Okapika	+26481 279 6754	
Mweendangul	Okapika		
Ileni Inareakia	Okaluano	+26481 409 5552	
Paulus Mungolo	Omutsegwoholongo		
Dominicus Ruben	Okapika	+26481 474 9792	
John Haikali	Ohenongo	+26481 457 689	
Paulus Mungolo	Omutsegwoholongo	+26481 409 5552	
Dominicus Ruben	Okapika	+26481 474 9792	
John Haikali	Ohenongo	+26481 457 689	
Ashipala Kornelia	Ohenongo	+26481 767 9631	
Nelundu Agrippine	Okapika	+26481 742 7911	
Shalimba Mikael	Okapika	+26481 616 1111	
Albertina Moungo		+26481 228 52	
Joseph	Ohenongo	+26481 617 6749	
Sofia	Okapika	+26481 598 6644	
Ailiphilwa Tobias	Okapika		

Titus Rauna	Okaluano	+26481 2065 175	
Shapaka.T	Ohenongo		
Lucia Shihep	Okapika	+26481 7354836	
Iita Selma	Okaluano	+26481 206 5175	
Angula Elastus	Omutsegwoholongo		
Maria Mbuneu	Omutsegwoholongo		
Malia Immaunuel	Okaluano		
Asteria Kephas	Ohenhongo	+26481 491 0378	
Mateus Sarafina	Oshifo	+26481 277 0993	
Ani Shekuoe Nuujoma	Omnawatjihozu	+26481 289 4493	
Kristofina Frans	`ongolonongeyama	+26481 2000 260	
Josef Shikololo	Oshifo	+26481 219 868	
Shapange Rakkel	Omumbonde	+26481 403 0500	
Saara Johannes			
Petrina Tjikaka	Otjaandjamwenyo	+26481 403 0500	
David Shihepo Haufiku	Oshifo	+26481 478 6614	
Paulus Ngluluwa	Etunda	+26481 4786614	
Nangolo Anna	Oshihabameya	+26481 650 7735	
Elizabeth Aron	Okashaningwa	+26481 272 7112	
David Ndjangaladi	Endunda	+26481 395 8768	
Esther H.S Iyagaya	Omubodi	+26481 618 9715	
Soin Katumbangwa	Okapika	+26481 422 7666	
Fenn Eino	Omudhuwahawanga	+26481 321 6596	
Hilma Moses	Omudhuwahawanga	+26481 733 4736	hilma@gmail.com
Ndapewa Jillipus	Omudhuwahawanga	+26481 735 6005	
Titus Imasa	Omudhuwahawanga	+2681 128 6905	
Ester Namusha	Omudhuwahawanga	+26481 479 4245	
Anastasia Amunyela	Omudhuwahawanga	+26481 552 6092	
Matte.S Elifas	Omudhuwahawanga	+26481 777 1077	
Ndeipanda T.Fikunawa	Omudhuwahawanga	+26481 299 1196	

Annanias Shivandu	Omudhuwahawanga	+26481 582 8512	
Thomas Nuyoma	Omudhuwahawanga	+26481 2715 230	
G.Ipumbu	Omudhuwahawanga	+26481 620 2333	
Mbwalala Yilho	Omudhuwahawanga	+26481 314 9021	
Mtheus.Ndemupanda	Omudhuwahawanga	+26481 429 5536	
Alfeus Negumbo	Omudhuwahawanga	+2681 124 9268	
Rosalia Ndilinawa	Omudhuwahawanga	+26481 564 9648	
Tuhafeni Shipanga	Omudhuwahawanga	+2681 330 3665	
Silas Eina	Omudhuwahawanga	+26481 217 3960	
Florian Kiayeya	Omudhuwahawanga	+26481 286 2895	
Simeon Arom	Omudhuwahawanga	+26481 320 9228	
Nangula Simoen	Omudhuwahawanga	+26481 746 6049	
Selma Ihula	Omudhuwahawanga	+26481 238 9733	
Regina Mesag	Omudhuwahawanga	+26481 368 5845	
Jason.S.Ndumbu	Omudhuwahawanga	+26481 248 4732	
Kaapangelwa iiyambo	Omudhuwahawanga	+26481 302 2661	gehasiiyamba@gmail.com
Hilma Mashuna	Engondo Village	+26481 285 3016	
Shinaeie Handunge	Omudhuwahawanga	+26481 319 9655	
Johannes Mutilwa	T/A Council	+26481 761 7915	
Philemon Mugungo	Omudhuwahawanga	+26481 289 3083	
Iiyambo Fillipus	Omudhuwahawanga	+26481 255 5428	m61kasa@gmail.com
Johannes Kakondo	Omudhuwahawanga	+26481 761 7918	
Lukas Mutilua	Omudhuwahawanga	+26481 232 3720	
Gabriel Shiimi	Omudhuwahawanga	+26481 2561 315	
Godeon Ishitile	Engondo	+26481 263 1117	
Ondemutega Nakambale	Omudhuwahawanga	+26481 2807 585	
Kamati Johannes	Omudhuwahawanga	+26481 381 4771	
Shapumba Annastasia	Omudhuwahawanga	+26481 298 6243	
Asteria Iita	Omudhuwahawanga	+26481 345 2398	
Martha Ipinge	Omudhuwahawanga	+26481 846 9244	
Natalia Eliakim	Omudhuwahawanga	+26481 215 1700	

Mateus Joseph	Omudhuwahawanga	+26481 207 0240	
Shilonga Lameka	Omudhuwahawanga	+26481 846 9244	
Diomasia Amunyela	Omudhuwahawanga	26481 214 8643	
Elina Muyela	Omudhuwahawanga	+26481 218 6615	
Andreas Amunyela	Omudhuwahawanga	+26481 214 8643	
Lisias Tolu	Omudhuwahawanga	+26481 458 0095	
Andreas Selma	Omudhuwahawanga	+26481 236 2255	
Shetuka Kertu	Omaenkuzi	+26481 309 5910	
Selma Shooya	Omanenepeke	+26481 309 5910	
Ndasilihenda Nashiku	Omaenkuzi	+26481 402 3161	
Miina Shooya	Ombome	+26481 214 6119	
Shivute oivia	Omanenepeke	+26481 298 1822	
Eelu Loide	Omaenkuzi	+26481 786 2997	
Alon Shitwngeni	Omaenkuzi	+26481 7514 092	
Iipinge Theophilus	Omanenepeke	+26481 308 9235	
Nashiki Henok Andjele	Omaenkuzi	+2681 307 1229	
Salmi shikalepo	Omaenkuzi	+26481 744 552	
Bengomen	Omanenepeke	+26481 686 8917	
Martina	Omanenepeke	+26481 475 1038	
Josefina	Omaenkuzi	+26481 396 8541	
Kashikuka Masdale	Omaenkuzi	+26481 643 3972	
Mushandi Selma	Omaenene	+26481 425 9305	
Katore Loini	Omalungu	+26481 421 0616	
Ruben Noa	Omaenkuzi	+26481 254 9116	
Sesilia Shipingana	Ombome	+26481 723 0329	
Abel Nekwaya	Omaenkuzi	+26481 299 0862	
Hilma.N. Silos	Omaenkuzi	+26481 432 3862	
Mateus Shetuka	Omaenkuzi	+26481 251 3371	
David Stefanus	Omaenkuzi	+26481 233 8224	
Linda Ipinge	Omaenkuzi	+26481 462 7869	

Aune Shaende	Omaenkuzi	+26481 338 7577	
Aule Rinda	Ongwali	+26481 371 4605	
Angula Hififaali	Okalonga	+26481 470 7412	
Andreas.T.Maluka	Okalonga A	+26481 274 9857	
Maria N Hambiya	Oiyale	+26481 280 5386	
Nehale Ndeyapo	Omaenkuzi	+26482 469 9811	
Kasino Tuwilika	Iyale		
Hertha Astrimbanga	Okandjulu	+26481 214 4465	
Teoupolina.B.Akwene	Ongwali	+26481 223 0164	
Juniasa Shikeshio	Oshana Shatema	+26481 420 7166	
Elisapela Nakale	Oluno	+26481 841 9918	

13. APPENDIX D: NEWSPAPER NOTICES TO I&APS.

14. APPENDIX E: STAKEHOLDER AND PUBLIC CONSULTATION MEETING MINUTES AND ATTENDANCE REGISTER

Below is a list of meeting minutes for the seven public meetings held in Ruacana South and Onesi Constituencies in Omusati Region for RSWSP Phase 1**:**

1. Omaenene Meeting minutes
2. Omudhuwahauwanga Meeting minutes
3. Oshifo Meeting minutes
4. Otjitho meeting minutes
5. Eenawa Meeeting minutes
6. Eunda Centre Meeting Minutes
7. Omayenkuzi Meeting Minutes

Below is a list of meeting minutes for key stakeholder meetings held for RSWSP Phase 1:

1. Omusati Regional Council meeting

Below is a list of attendance register for the seven public meetings held in Ruacana South and Onesi Constituencies in Omusati Region for RSWSP Phase 1:

1. Omaenene Meeting Attendance Register
2. Omudhuwahauwanga Meeting Attendance Register
3. Oshifo Meeting Attendance Register
4. Otjitho Meeting Attendance Register
5. Eenawa Meeting Attendance Register
6. Eunda Centre Meeting Attendance Register
7. Omayenkuzi Meeting Attendance Register

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Omaenene Village Meeting point

DATE: Thursday, 20 July 2023

TIME: 10:00 PM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson Zvobgo– Researcher

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Ms. Martha Hangula - Ministry of Agriculture, Water and Land Reform

Mr. Shikwa - NAMWATER

Attendees:
(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	

	• D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER were introduced. • Translation was done by Ms. Martha Hangula	
2.	**Background of the Study and project (Information can be obtained in the BID)**	
	• Background of the study. • Explain why this meeting is held. • The project location was shown on the map document, which was distributed, and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	**Mr. Luckson**
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Ms Milan Francina:** When work start please recruit our people. And don't bring contractors that will not pay our people like the current contractor (Bruna) who was busy with the cannel.	• **Mr. Luckson**: We are going to recommend for employment that non-technical labour should come from the local community. If there are people who can support with technical labour, they should be given priority. This way, the project will benefit the local community rather than people from other areas.
Infrastructure	• **Ms Milan Francina:** The current contractor working on the canal broke my pipeline, and the water meters are buried. Please, for this project, do not bring such contractors.	• **Mr Sikwa:** I have taken note of this and il follow-up on this issue.

Impact	• **Mr. Hosea:** Is it possible for a grave to be relocated?	• **Mr. Roland Mushi:** Yes, graves can be moved to another location. However, there are procedures that will take place in order for the graves to be relocated, such as consultations and approval from the affected families.
Compensation	• **Mr. Hosea:** Is it possible to divert the pipeline if I prefer not to receive compensation if the pipeline passes through my field or private property?	• **Mr Sikwa:** The off-take pipes cannot be diverted.
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING.

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Omudhuwahauwanga Shopping Centre meeting point

DATE: Tuesday, 18 July 2023

TIME: 09:30AM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson Zvobgo – Environmental Consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Ms. Martha Hangula - Ministry of Agriculture, Water and Land Reform

Mr. Shikwa - NAMWATER

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• Hon. Andreas Shintama welcomed D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER. • Mr. Longeni Ndjaleka introduced the team (D&P Engineers and Environmental Consultants) • Translation was done by Hon. Andreas Shintama and Mr. Longeni Ndjaleka	
2.	**Background of the Study and project (Information can be obtained in the BID)**	
	• Background of the study • Explain why this meeting is held.	**Mr. Luckson**

	• The project location was shown on the map document which was distributed and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Mr. Iyambo K**: Will there be job opportunity for the local people.	• **Mr. Luckson**: Yes, local people will be employed. This will be facilitated through the councillor's office or the headman. Our goal is to engage members of the community to enhance their livelihoods
Poroject layout/ description	• **Mr. Iyambo K:** Can you explain in details were the pipeline will pass through, because I will not know if the pipeline affects me, if I don't know where it runs.	• **Mr. Luckson:** Th he nearest point where the pipeline will run is about 10 km from here, at the turn to Oshifo; that is phase one. When phase two is implemented, it will extend to this area. Therefore, for now, the pipeline ends at Oshifo. What we are currently doing is sensitization. When phase two arrives, everyone will be informed and involved.
	• **Mr. Jason Ndumbu:** We have examined the map and noticed that the pipeline does not pass through our village. Why are we being consulted if this phase does not include us?	• **Mr. Luckson:** Firstly, when we undertake projects of this nature, both the positive and negative impacts do not only affect the village where the project is being carried out. These impacts can extend as far as 20-40 km from the project site. • Secondly, it's challenging to implement this kind of project all at once, which is why we are approaching it in phases. The concept is that once we have water available at the final point, the subsequent step is to extend it from the previous

		point to the next (Phase 2-4). To prepare for this progression, we need to initiate the process of sensitization.
Compensation	• **Mr. Silas Eino:** If the pipeline passes through my field or property, will there be compensation?	• **Miss Martha Hangula**: We understand that there might be compensation issues when the pipeline passes through your field. Not everyone will be compensated, as it depends on the specific circumstances of each case. If the design engineering team identifies people who are affected, the ministry will revisit and conduct consultations. This process will occur alongside the project's development. We urge you to cooperate because the project could face delays if an individual fails to agree on a certain price or condition, causing a standstill. • Mr. Luckson: As Ms. Martha mentioned, it depends on a case-by-case basis, considering how each field or private property will be impacted by the project. Measures will be established to address this type of issue
General comment	• **Mr. Jason Ndumbu:** Some of the names are misspelled. Please make sure the names are spelled right.	• **NOTED BY THE CONSULTANTS**
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING.

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Otjitho Village meeting point

DATE: Friday, 21 July 2023

TIME: 15:00 PM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson Zvobgo – Environmental Consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Members from the community

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER were introduced. • Translation was done by Mr. Longeni Ndjaleka	
2.	**Background of the Study and project (Information can be obtained in the BID)**	
	• Background of the study. • Explain why this meeting is held. • The project location was shown on the map document which was distributed and a brief description of the water scheme was described.	**Mr. Luckson**

	• All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Tuhafeni (Headwomen):** Please inform the construction company that our village has a lot of unemployed people. They should consider hiring individuals from this village.	• **Mr. Luckson**: We are going to recommend for employment that non-technical labour should come from the local community. If there are people who can support with technical labour, they should be given priority. This way, the project will benefit the local community rather than people from other areas.
	• **Andreas vissau:** Do they already have people working for them, or will they recruit new employees?	
	• **Paula's Angula:** Many people in this area do not have documents. How will they recruit people without proper documentation?	• **Mr. Luckson:** We will note this down, however documents are usually required and it's up to the contracted to decide how they will do their recruitment.
Duration	• **Frans Nangolo (Headman):** When is the project scheduled to begin?	• **Mr. Luckson: a**fter we receive the environmental clearance certificate from the Ministry of Environment, Forestry, and Tourism, the designs will be finalized. Subsequently, we will prepare and issue the tender documentation. The tendering process will take approximately one month, during which we will carefully evaluate and select the best contractor for the job. Therefore, January or February is the estimated timeframe.
	• **Paula's Angula:** when will construction start?	

Infrastructure	• **Tuhafeni (Headwomen):** Will there be a new pipeline, or will it be an existing one?	• **Mr. Luckson::** If there is an existing pipeline, then it will be upgraded, if there is no pipeline in an area, a new pipe will be established.
Project layout and description	• **Ileni malakia:** Where is the pipeline coming from, and where is it going? • **Paula's Angula:** Which direction will the pipeline run?	• **Mr. Luckson:** The pipeline will run from Oludhansda all the way to Ruacana, it will branch off into different point inward.
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING.

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Eenawa

DATE: Thursday, 20 July 2023

TIME: 14:07 PM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson Zvobgo – Environmental Consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Ms. Martha Hangula - Ministry of Agriculture, Water and Land Reform

Mr. Shikwa - NAMWATER

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER were introduced • Translation was done by Mr. Longeni Ndjaleka	
2.	**Background of the Study and project (Information can be obtained in the BID)**	

	• Background of the study • Explain why this meeting is held. • The project location was shown on the map document which was distributed and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	**Mr. Luckson**
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Mr. Kantu Tobias:** Will they hire locals or will they come with their own people?	• **Mr. Luckson**: We are going to recommend for employment is that nontechnical labour should come from the local community. And if there are people that can support with technical labour they should be given priority. So that the project benefit the local community and not people from other area.
Duration	• **Ms Nangula Beth**: When will construction start? We are thirsty.	• **Miss Martha Hangula:** After we receive the environmental clearance certificate from the Ministry of Environment, Forestry, and Tourism, the designs will be finalized. Subsequently, we will prepare and issue the tender documentation. The tendering process will take approximately one month, during which we will carefully evaluate and select the best contractor for the job. Therefore, January or February is the estimated timeframe.
	• **Ms caroline Paavo:** Your saying construction will start in January. This is a flood area. Will you be able to do any construction?	• **Mr. Luckson:** This is why we are doing the ESIA. We will note this now.

Project layout / description	• **Mr Malakia:** Is it a new or old pipeline because in our village there is no water pipeline. We would like to know were the pipeline will start an**d go.** • **Mr. Philipus Beira:** So you will upgrade and build new pipelines in villages? I want to know were the pipeline will branch out, with how many km and where will the pipeline run	• **Mr. Luckson:** I believe it will start at Olushandja water treatment. The pipeline will run from Oludhansda all the way to Eunda. At Eunda, it branches off in different directions but stops before Onesi. Your village is included in this scope. If there is an existing pipeline it will be upgraded to reach areas that currently do not have water access. Currently we only have preminary designs.
Impact	• **Mr. Mateus:** If the pipeline passes through my house, will it not damage my property. • **Mr. Mateus:** If the pipe passes through the school, will it be moved.	• **Mr. Luckson:** Measures will be established to address this type of issue. A grievance redress mechanism document will be developed and operationalized.
	• **Ms Christophine chicocume:** There are different Eenawa. The one this side does not have water.	• **Noted.**
Infrastructure	• Ms Kamati Albertina: Is it possible to take out water and take to our houses?	• **Mr. Shikwa:** Yes its possible.
General comment/ Questions	• **Mr. Philipus Beira:** I would like to thank you all even though the project didn't start, I would like to ask why you didn't include NAMPOWER. Water is life but electricity is also life. We have houses here without electricity.	• **Miss Martha Hangula:** The requirement that his talking about is the requirement that brought us here, that we are required to talk to the community and host consultative meetings.
	• **Ms liberty Amadhila:** we have been gathering for too long about this water issue. We keep being told water is coming is it never comes. Currently we drink water that is very dirty. The crowd was	• **NOTED BY ALL IN ATTENDANCE**

	suppose to be bigger then this but some people didn't come due to empty promises.	
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Eunda Centre

DATE: Wednesday, 19 July 2023

TIME: 15:07 PM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson – Environmental Consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Ms. Martha Hangula - Ministry of Agriculture, Water and Land Reform

Mr. Shikwa - NAMWATER

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER were introduced. • Translation was done by Ms. Martha Hangula	
2.	**Background of the Study and project (Information can be obtained in the BID)**	

	• Background of the study. • Explain why this meeting is held. • The project location was shown on the map document which was distributed and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	**Mr. Luckson**
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Mr. Andreas Mahulu:** How many people will be recruited for the project?	• **Mr. Luckson**: We are going to recommend that non-technical labor should come from the local community. If there are people who can provide technical labor support, they should be given priority. This way, the project will benefit the local community rather than individuals from other areas. • **Miss Martha Hangula:** We are not the ones building; a contractor will be responsible for the construction, and they will be recruited by the ministry. It's up to that contractor to decide the number of people they will hire.
	• **Mr. Paulus Hambia:** Before the real work start, will they make another meeting for jobs or they will advertise or were should we submit our papers.	• **Mr Sikwa:** The contractors that will be awarded will be responsible for that. How the recruitment process will go will be up to them; currently, we do not have that information.
Duration	• **Mr. Geingos:** When will the project start?	• **Miss Martha Hangula**: After we receive the environmental clearance certificate from the Ministry of Environment, Forestry, and Tourism, the designs will be finalized. Subsequently, we will prepare and issue the tender documentation. The tendering process will take approximately one month, during which we will

		carefully evaluate and select the best contractor for the job. Therefore, January or February is the estimated timeframe.
Affordability	• **Mr Kanyele: R**ural Water Supply department brought us water, which we are thankful for; however, they closed water for the animals. If this project is implemented, will you not do the same?	• **Mr Sikwa:** The animal troughs for water that you see are closed because people owe millions. If you have a water committee and you want to use this water, Rural will host a meeting for you and take names for the committee that was chosen, and the animal troughs will be opened. However, it's up to you how you will manage it. Therefore, it's all up to you.
Infrastructure	• **Ms. Aground Kapuka (Okanjulu village)**: We are very thankful for coming and explaining this project to us. Currently, we have a pipeline running along the road, but water can be off for even a week, and it has low pressure. I would like to find out if that pipeline is old because every time the community has to fix that pipe as it bursts often. • • Mr. Andreas Anyele: Why is the pipeline always bursting? Is the pressure too high?	• **Mr Sikwa:** I don't know how big or long that pipeline is and where it came from. Some of these pipes placed in the areas are actually leftover from a previous project, and those pipes might have been exposed to weather like the sun for some time, even five years. This reduces the quality of the pipes and leads to them easily bursting. For instance, if those pipes were initially of Class 9 quality, they may no longer meet that standard. It might also be the case that when people bid for tenders and provide quotations, the government often opts for the lowest bid.
	• **Mr. Kanyele Malakia:** Does the project include Rural or Namwater? Our meters were changed without informing us, and it seems like Rural is cheating us.	• **Mr Shikwa:** Rural has its own branch lines; they tap water from NAMWATER to these branch lines. These branch lines are administered by Rural Water Supply. However, I don't understand how the water meter was changed from NAMWATER to Rural, unless it's the other way around. But I believe that the pipeline still belongs to NAWATER as it has not changed.
Compensation	• **Mr. Shetu Joseph:** If the pipeline passes through my field or property, will there be compensation?	• **Miss Martha Hangula**: We understand that there might be compensation issues when the pipeline passes through your field. Not everyone will receive compensation, as it depends on the specific circumstances of each case. If the designing engineering team identifies individuals affected, the ministry will conduct further consultations. This process will occur concurrently with the development. We are urging you to cooperate, as the project could experience delays if an individual refuses to agree on a certain price or element, bringing the

		project to a halt. However, please note that the design is not yet final.
General comment/ Questions	• **Mr. Shetu Joseph:** You talked about requirements, can you explain about those requirements.	• **Miss Martha Hangula:** The requirement that he's talking about is the requirement that brought us here; we are required to engage with the community and host consultative meetings.
	• **Mr. Shetu Joseph:** You talked about ancestors, which ancestors are you referring to, is it cemeteries, worship area?	• **Miss Martha Hangula:** Yes, you are correct; he is talking about that. However, if the pipeline is passing through this area, procedures will be put in place either to relocate those areas or to implement measures, procedures, and consultations.
	• **Ms. Tiopolina Biata Aleena:** I would just like to express how happy I am to hear about this project coming into our community. • **Mr. Andreas:** I support this project because in my village, we drink water from a well. • **Ms. Aground Kapuka**: I would like to thank MAWLF and the government for bringing water to every child in Namibia. I hope that when the project comes, they will recruit some of the locals and provide them with opportunities to earn a living. Thank you.	• **NOTED BY THE CONSULTANTS**
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING.

PROJECT: THE RUACANA SOUTH WATER SUPPLY PROJECT PHASE 1 IN THE OMUSATI REGION

VENUE: Omayenkuzi

DATE: Friday, 21 July 2023

TIME: 09:30 PM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Dr. Luckson Zvobgo – Environmental Consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

Mr. Roland Mushi - Archaeology Consultant

KEY STAKEHOLDER

Ms. Martha Hangula - Ministry of Agriculture, Water and Land Reform

Mr. Chimwanga Maseka - NWSSP

Mr Paavo H - Ministry of Agriculture, Water and Land Reform (Rural)

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• D&P Engineers and Environmental Consultants and key stakeholders from the Ministry of Agriculture and NAMWATER were introduced. • Translation was done by Mr. Longeni Ndjaleka	

2.	**Background of the Study and project (Information can be obtained in the BID)**	
	• Background of the study. • Explain why this meeting is held. • The project location was shown on the map document which was distributed and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles. • The procedure of obtaining and need for an environmental clearance certificate for the project was explained. • An Environmental and Social Management Plan will be crafted to give remediation and action measures.	**Mr. Luckson**
3.	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE
Benefit	• **Stefanus David:** Where will they hire people? Are you selecting a few individuals from the community where the pipeline is passing, or will you be bringing your own people?	• **Mr. Luckson:** We are going to recommend that non-technical labor should come from the local community. If there are people who can provide technical labor support, they should be given priority. This way, the project will benefit the local community rather than individuals from other areas.
	• **Mr. Chimwanga Maseka:** Are men willing to give women a chance and allow them to do jobs traditionally held by men?	• **Mr Abel Nekwaya:** Yes, we are. The pipeline that you see was dug by women.
Impact	• **Mr. Luckson:** Is there any gender-based bias regarding water issues? How has he observed differences between households headed by men and those headed by women?	• **Mr Abel Nekwaya:** So far, there is nothing. However, I cannot speak for them. • **Mr. Luckson:** If you can't speak now and you are concerned about being targeted, there is a number behind the BID that you can contact. The information you provide will be anonymous.
	• **Ms salmi shikalipi:** Mr Paavo, how is it that I have a tap in my house that is only being used by one person, yet the water bill can reach up to 800? Why didn't they provide	• **Mr. Paavo: J**ust bring along your card, and we will investigate the matter.

	instructions on how to read the meter? I want to figure this out. Why can't they refund me?	
Duration	• **Ms. Selma Shooya:** When is the project scheduled to begin?	• **Ms. Martha Hangula:** After we receive the environmental clearance certificate from the Ministry of Environment, Forestry, and Tourism, the designs will be finalized. Subsequently, we will prepare and issue the tender documentation. The tendering process will take approximately one month, during which we will carefully evaluate and select the best contractor for the job. Therefore, January or February is the estimated timeframe.
Infrastructure	• **Mr. Matheus shetuka:** We have an issue with our current pipeline, there are times when the water stops working for a full week, and then it starts working again. We had gardens, but the plants died due to inadequate water supply. The water is not sufficient.	• **Mr Paavo:** The current plant could only cater to the pipeline that was previously existing. However, over the years, more people have connected to this pipeline, and the plants cannot support the distribution to all these pipelines. That is why the plants will be upgraded in order to cater to all these pipes.
Project layout and description	• **Mr Abel Nekwaya:** Where is the pipeline passing? Since the pipeline is coming from Olushanja to Eunda. • **Mr. Matheus shetuka:** Where will the water be cleaned, and where will the water distribution end? Does it reach Onesi?	• **Mr. Luckson:** I believe it will be cleaned at Olushandja water treatment. The pipeline will run from Oludhansda all the way to Eunda. At Eunda, it branches off in different directions but stops before Onesi.
	• **Ndasilihenda nashiku:** Does the pipeline just go straight, or will it make any turns? You mentioned the pipeline will run directly all the way. Are you implying that all the houses that will be affected will receive compensation? • **Ms Hilma Silas:** You mentioned that the pipeline will come from Eunda and then reach here. Will it connect to our existing pipeline? • **Selma Mushandi:** Given that a new pipeline will be coming from Eunda, will the old one be decommissioned?	• **Mr. Luckson:** One of the reasons why we are here is to understand the project area, and that's why we also have our archaeologist present. We will identify archaeological points of interest, such as graveyards or historical sites. Then, we will assess if the pipeline is passing through these areas to determine if there's any heritage or significant site. However, since there is an existing pipeline, it won't affect houses. Instead, it will be upgraded to reach areas that currently do not have water access. Only villages without distribution mains will be affected.
Training	• **Mr. Luckson:** Have you all been trained on how to read the water meters?	• **Mr Abel Nekwaya:** No, we have not been trained. However, some people know how to read the water meters, while others don't. The

		confusion arises because we have two types of water meters, and they are read differently.
Compensation	• **Stefanus David:** I see that the pipeline is passing through my field. How do you plan to address these situations and mitigate the impacts?	• **Mr. Luckson:** What we have now are preliminary designs, and in these preliminary designs, if we see that the pipeline is passing through homesteads or fields, what we are going to do is provide a framework that outlines the steps if the pipeline is passing through someone's property. This framework will detail the procedures from negotiations to compensation, but the process will vary case by case, guided by this framework. A grievance mechanism will be developed for cases of grievance.
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising on giving comments in writing.	• **NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting)

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 03 August 23
EDITED: _____ **Date:**
APPROVED: _____ **Date:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE RUACANA SOUTH PHASE 1 AND RESERVOIR RURAL WATER SUPPLY SCHEMES IN THE OMUSATI REGION UNDERTAKING OF PUBLIC CONSULTATION MEETING.

PROJECT: THE RUACANA SOUTH PHASE 1 AND RESERVOIR RURAL WATER SUPPLY SCHEMES IN THE OMUSATI REGION

VENUE: Omusati Regional Council

DATE: Friday, 14 July 2023

TIME: 09:30AM

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) / CONSULTANT:

Mr. Adiel Tara - Environmental & Ecology consultant

Ms. Shiwayu Kristian NN - Environmental Consultant

Mr. Longeni Ndjaleka - Engineer Consultant

KEY STAKEHOLDER

Officials from Regional Council

Attendees:

(Please find proof of the Attendance register attached at the end of this document.

Proceedings:

ITEM	DESCRIPTION	PERSON
1.	**Welcome and Introductions**	
	• Hon. Erginus Endjala welcomed D&P Engineers and Environmental Consultants and key stakeholders • Mr. Adiel Tara introduced the team (D&P Engineers and Environmental Consultants) • Hon. Erginus Endjala Introduced his team (Omusati Regional Council)	
2.	**Background of the Study (Information can be obtained in the BID)**	
	• The project location was shown on the map document which was distributed and a brief description of the water scheme was described. • All anticipated changes to the environment because of the project were discussed by the consultant so that the attendees would understand the implications of the project from both positive and negative angles.	**Mr. Adiel Tara and Ms Kristian Shiwayu**

	● The procedure of obtaining and need for an environmental clearance certificate for the project was explained. ● An Environmental and Social Management Plan will be crafted to give remediation and action measures.	
3.	**Purpose of the meeting (Information can be obtained in the BID)**	
	● Comply with Namibia's Environmental Assessment Policy, Environmental Management Act (No. 7 of 2007) with its 2012 EIA Regulations and the African Development Bank (AfDB) Environmental and Social Assessment Procedures (ESAP) 2015 and the Integrated Safeguards System (ISS) 2013; ● Consult all interested and affected parties such as local residents, Regional Council etc. to ensure that their inputs are taken into account; ● To set up a grievance redressal system; ● To identify Environmental and Social safeguards and concerns prior to project implementation; ● To assess the significance of issues and concerns raised; ● Review the legal and policy framework and its relevance to this project; ● To determine the environmental and social impacts of the development and assess site suitability; ● To identify all environmental and social sensitivities that may be affected by the proposed development and monitoring requirements during construction thereto; ● Develop a clear, concise and practical Environmental and Social Management Plan (ESMP) addressing the following key areas: ➢ Waste Management Plan ➢ Grievance Redress Mechanism ➢ Stakeholder Engagement ➢ Pollution Prevention and control ➢ Ecosystems and Biodiversity Management ● To institute processes for Environmental monitoring and management for compliance to the developed Environmental and Social Management Plan.	**Mr. Adiel Tara and Ms Kristian Shiwayu**
4	**Q & A Session**	

Q & A Session

Issue Category	COMMENTS, QUESTIONS, QUERIES, AND CONCERNS RAISED	RESPONSE

Key issues which need to be considered. (Recommendations)	• **Hon. Erginus Endjala:** When conducting your business, it is essential to exercise caution and be sensitive to cultural issues, those areas are inhabited by Vambos, Gwambe, and Herero communities. Respecting and understanding their cultural values and practices is of utmost importance in these regions • **Hon. Erginus Endjala:** Indeed, it's crucial to consider the level of literacy and awareness within the community. Not everyone may be well-versed in various issues, so engaging with local councillors can greatly facilitate your efforts. They can act as intermediaries and introduce you to the community. • **Hon. Erginus Endjala:** Water is indeed essential for life, and it's beneficial to personally visit the project site to observe the situation on the ground. You'll witness areas facing water scarcity with limited access to water, such as in the case of boreholes, while some water sources may be saline. We are hopeful that this project will be completed within a reasonable timeframe, although we understand that budget constraints could pose challenges. Our primary goal is to see this project through, and we aspire for it to be finished within our lifetime, as it will undoubtedly make a significant difference to the community's well-being.	• **Mr. Adiel Tara:** Noted, we will put that into consideration, and we had a similar concern again when we were in Katima. They were also saying, "Water is life." We really need to speed up; we need to get the work done rather than discussing
Where to from here and how to stay involved in the EIA process?	• Comments are still welcome on the project. A registration and comments form were provided during the meeting thus emphasising.	**NOTED BY ALL IN ATTENDANCE**

Attachments to the Public Consultation Meeting Minutes: Attachment 1 – Public Meeting Attendance Register and Completed Questionnaire Forms (as received from the Public Consultation Meeting).

SUBMITTED: Ms Kristian NN Shiwayu _____ **Date:** 26-July-23
EDITED: **Date:**
APPROVED: _____ **Date:**

15. APPENDIX F: OMUSATI REGIONAL COUNCIL CONSULTATION/ENGAGEMENT LETTER.