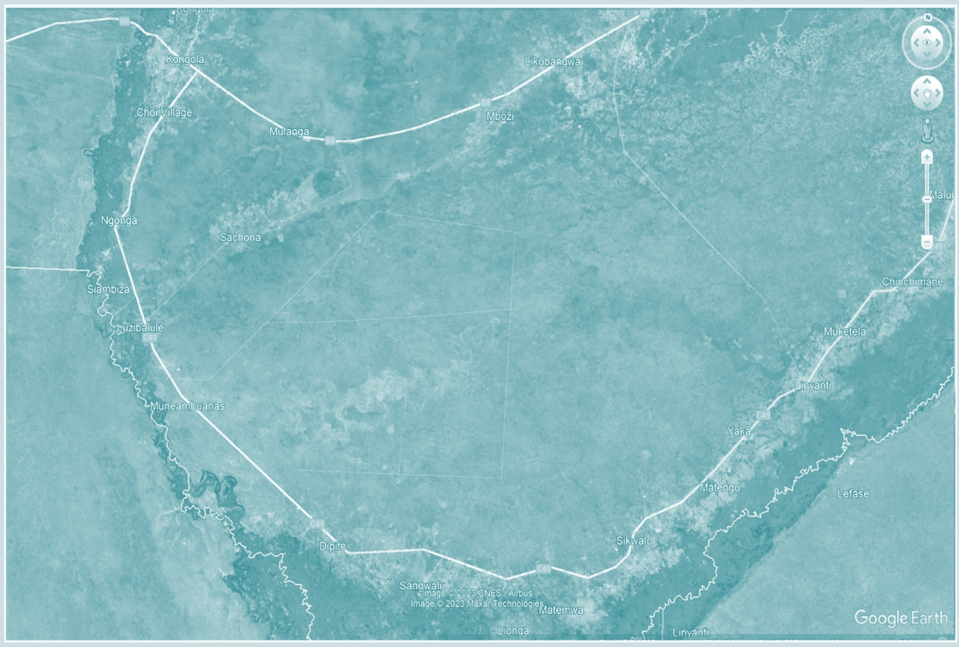
November 2024



KATIMA MULILO-KONGOLA WATER SUPPLY PROJECT PHASE 3

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

ENVIRO DYNAMICS
Environmental Management Consultants

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ABBREVIATIONS

CoC	Code of Conduct
DEA	Department of Environmental Affairs
CO	External Compliance Control Officer
ESMP	Environmental and Social Management Plan
I&AP	Interested and Affected Party
RE	Resident Engineer
MAWRD	Ministry of Agriculture, Water and Rural Development
MEfT	Ministry of Environment, Forestry and Tourism
PPE's	Personal Protective Equipment

1 INTRODUCTION

1.1 BACKGROUND

The Ministry of Agriculture, Water and Land Reform (MAWLR) plans to construct a 110km water pipeline from Kongola along the C49 National Rover to Linyanti (Figure 1). Water will be abstracted from the Cuando River and new water offtake points will be provided along this main pipeline route in order to cater for the villages in the area. The Project is referred to as Katima-Kongola Water Supply Project Phase 3.

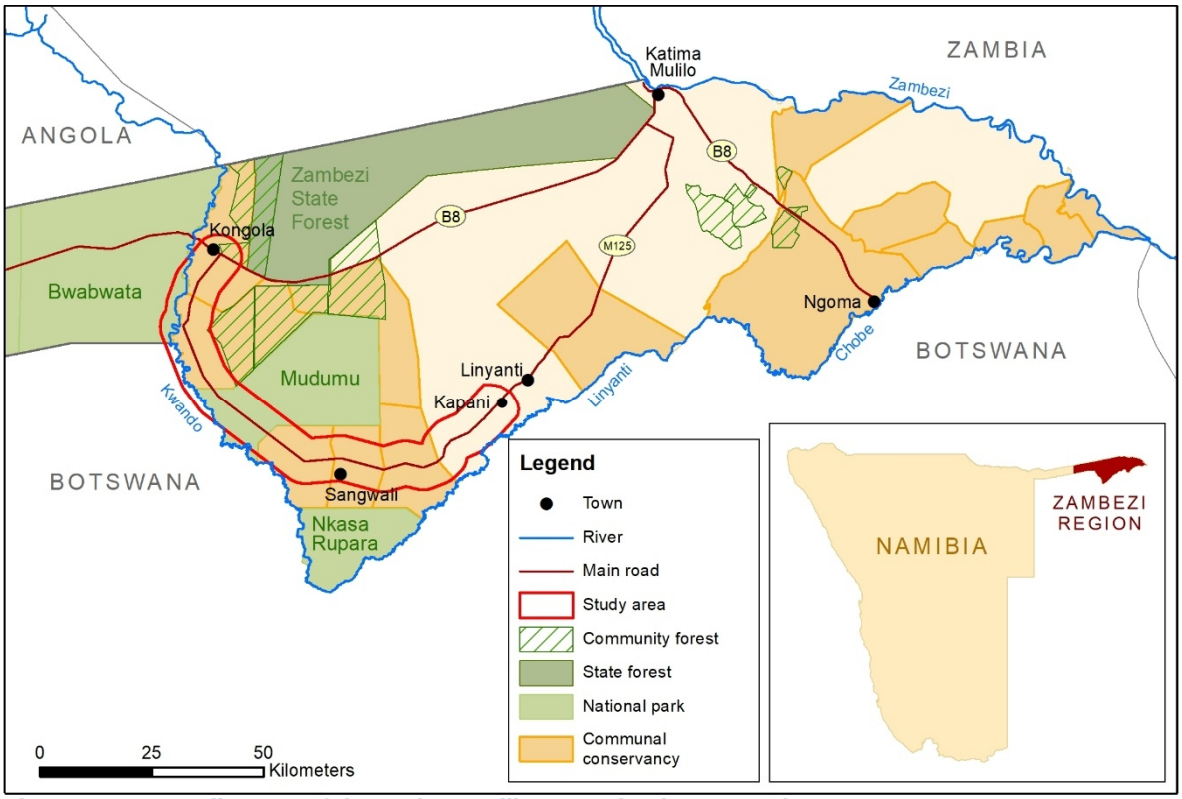

Figure 1 Locality Map of the Katima Mulilu-Kongola Phase 3 Project

The project is part of the Water Sector Support Program (NWSSP) which is co-funded by the African Development Bank (AfDB) and GRN. The overall development sector goal is to support sustainable production and consumption of water resources, sanitation facilities, and promotion of hygiene good practices.

This particular project will satisfy the above national aims , ensure reasonable access to water supply in the study area, and relieve community water demand and frustrations.

Enviro Dynamics is completing an Environmental and Social Impact Assessment and Environmental and Social Management Plan (ESMP) for MAWLR, in terms of Namibia's Environmental Management Act (2007) and its Regulations (2012) and the environmental and social requirements of the African Development Bank (AfDB), who are the co-funders of the Project.

This report contains the ESMP, which details the mitigation measures, monitoring requirements and the associated implementation arrangements to ensure compliance during planning, construction and operation of the project.

1.2 What is an Environmental and Social Management Plan?

Environmental and Social Management Plans (ESMPs)[1] are important tools that focus on the management actions that are required to ensure environmental compliance of a project. The Regulations (2012) of the Environmental Management Act (2007) state that "the environmental management plan shall set out steps that are intended to be taken to manage any significant environmental impact that may result from the operation of the undertaking".

ESMP implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action, ensures conformance with stated ESMP aims and objectives. An ESMP must respond to unforeseen events and changes in project implementation that were not considered before. Through monitoring and auditing, feedback for continual improvement in environmental performance must be provided and corrective action taken to ensure that the ESMP remains effective.

1.3 What are the legal implications and obligations under this plan?

The Environmental and Social Management Plan will be submitted to the Directorate of Environmental Affairs (DEA) of the Ministry of Environment, Forestry and Tourism (MEFT) for approval. Once the DEA is satisfied with the contents of the ESMP, they will issue a pro-forma Environmental Clearance Certificate to DRWS. The Environmental

[1] The Environmental Management Act refers to an "Environmental Management Plan (EMP), while international safeguards usually refer to an Environmental and Social Management Plan (ESMP). The latter term is used henceforth in this report.

Clearance Certificate is linked with the recommendations of the Environmental and Social Management Plan. Bi-annual monitoring reports are required, which spell out the compliance details for that particular 6-month period and these are reviewed by the DEA, at least during the submission of the 3-year ECC renewal process.

The ESMP, once accepted with the issuance of the Environmental Clearance, therefore becomes a legally binding document and each role-player including contractors and sub-contractors who are made responsible to implement the relevant sections of this ESMP, are required to abide to the conditions stipulated in this ESMP document.

2 PROJECT DESCRIPTION

2.1 WATER ABSTRACTION FACILITY

The envisaged upgrade of these facilities will include a new water abstraction facility, river pump station, pipeline and pump sump. A new electrical pump set will be supplied and connected to the grid.

The pump sump is connected to the Cuando River with a a pipeline, at a specific gradient to allow the river water to gravitate into the sump. The pumps are installed where the river water is not stagnant, which avoids the intake of bilharzia-carrying snails and water enriched with high organic matter. The pumps are also placed at a locality that will prevent erosion.

The required capacity of the intake works is being designed to cater for the water supply requirements of all phases.

Figure 2: Locality of Abstraction point and treatment facility

2.2 THE WATER PURIFICATION PLANT

The existing package treatment plant, has a clear water storage reservoir (400 m_3) and booster pump station, all recently constructed as part of Phase 2 of the project (Figure 3).

Figure 3: Existing water treatment plant and clean water reservoir (LCE, 2022)

Another set of treatment plant containers, reservoirs and pumps will be added as required and constructed directly adjacent to the present facilities within the existing disturbed footprint to cater for the higher demand of Phase 3.

The existing plant has a capacity of 48 m^3/h (2 x 24 m^3/h). Under the scope of construction for Phase 2 of the Project, a flow of 25.3 m^3/h was assumed. A capacity upgrade of 80 m^3/h is required for Phase 3 as the bulk pipeline network expands.

2.3 WATER PIPELINE AND OFFTAKES

A new underground main water pipeline will be constructed for approximately 110 km within the road reserve of the C49 from Kongola towards Singoveka (Linyanti). It is recommended to replace the existing raw water pipeline (serving the communities around Kongola) with a new 250 mm diameter uPVC pipeline with a capacity of 109.1 m^3/h.

Approximately 19 secondary offtake branches are envisaged from 90 mm to 50 mm in diameter (class 6 uPVC) depending on the amount of households to be serviced.

At the end of each branch a number of elevated water tanks will be constructed. A private off-take / manifold water meter installation consists of one to six private off-takes (Figure 4). The private user can either fetch water at the manifold installation or connect their own pipeline to a designated water meter. A metal cage will be installed on a reinforced concrete base slab to protect the pipe work and the water meters. Locking devices with lock and keys will be provided to prevent the misuse of water.

Figure 4: Manifolds (water meters) and elevated water tanks at Phase 2 (LCE, 2022).

2.4 ACTIVITIES EXPECTED DURING THE PLANNING, CONSTRUCTION,OPERATION AND DECOMMISISONING PHASES

2.4.1 PLANNING PHASE

During this phase, the Engineering Team is finalising their designs to be approved by the MAWRD and the AfDB. There are no physical activities undertaken on the construction site during this phase, although decision making and preparatory activities have a significant bearing on the success and outcome of the project, also from an environmental and social point of view. Some activities important in this regard include:

- Survey of the line route (determines final number of structure and trees to be affected)
- Final decision-making regarding design paraments
- Preparation of contract documents, including the determination of environmental and social obligations.

Some final decisions regarding the fine tuning of the pipeline route, will only be made by the Contractor as they finally lay out the pipeline. This will be done with the aim to avoid all community structures and assets.

2.4.2 CONSTRUCTION PHASE

2.4.2.1 Activities

Construction activities would include, but are not limited to, the following:

- General construction activities, e.g. material handling (including materials such as epoxy, bitumen, oils, and fuel);
- De-bushing of a ±15 m corridor for the servitude;
- Preparation of the pipeline trench, using manual labour. The dimensions of the trench will be 200mm diameter pipeline, in a trench of app. 1 m deep and 0.5m wide ;
- Earthworks, including cut to stockpile, ripping and compaction;
- Overburden (topsoil and subsoil) stripping where necessary.
- Construction vehicle movements to transport equipment, material and staff to the construction site via the C49.

2.4.2.2 Labour budget for the construction phase

The construction phase has a labour budget as follows:

- Contract Manager (1);
- Site Foreman (8);
- Surveyor (1); and
- Labourers (200 - 400+). These labourers will not all work simultaneously, but will work on the portion of pipeline in there are, estimated to be approximately 20 workers per section.

The community stressed the importance of recruiting the local people as labourers, including women.

The Contractor will make a fenced construction yard to store equipment and materials and as the offices for the management and administrative functions of the Engineer, Client's representative and Contractor's Site Foreman.

2.4.3 OPERATIONAL PHASE

The abstraction and treatment facilities including the pipeline will have an operational lifetime of approximately 15 to 20 years. During this period, the pipeline, abstraction point, purification plant, tank stands and manifolds need to be maintained in the event of breakdowns and leaks. The abstraction and treatment facilities will have general operations, according to standard operating procedures and emergency response protocol.

The operational phase of the project will be under the supervision of NamWater, who will also be responsible for the metering and billing of the water. The existing staff complement of NamWater will operate this project. New positions may be created in time for the additional work load, especially in the Zambezi Region, but there will be no recruitment of people on a large scale.

2.4.4 DECOMMISSIONING PHASE

The decommissioning of this project is not foreseen in the near future, since its aim is to provide water for the local villages in the project area. The planning horizon provided for the pipeline is 2038/2039. The capacity of the project facilities should be monitored against the population growth in the area. Should capacity be outgrown, then the pipeline may need to be replaced.

Should this occur, or the project be decommissioned altogether, the pipeline would most likely be left *in-situ.* Any materials removed will nevertheless have to be disposed of at an approved waste disposal site, or recycled. The best disposal options at the time should be investigated.

The decommissioning phase will otherwise have the same management actions required as the construction phase, although a detailed decommissioning plan should be compiled at the time.

3 INSITUTIONAL AND ORGANISATIONAL ARRANGEMENTS OF THIS ESMP

3.1 During the planning phase

The appointed engineering team is to ensure that all the mitigation measures, mainly to avoid impacts, are implemented during the planning phase of the project (See Section 5.1). The MAWRD shall review the design submissions made, to ensure that all environmental and social requirements to be implemented under the planning phase have indeed been included.

The engineering team shall also ensure that the construction phase management actions described in this ESMP (Section 5.3), are included in the construction contracts, that the contractor are made aware of these provisions, that they are budgeted and practically provided for, and that the contractor has the required competencies to carry them out.

3.2 During the Construction Phase

3.2.1 ESMP administration

Copies of this ESMP shall be 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 and assure that all personnel under their authority are properly inducted in the content of the ESMP.

3.2.2 Roles and Responsibilities

The implementation of this ESMP requires the involvement of several role players, each fulfilling a different but vital role to ensure sound environmental management during each phase.

These are the:

- Resident Engineer (RE)

- Health, Safety and Environmental (HSE) Site Officer
- Contractor (Con)
- External Compliance Officer (CO)

Employer's Representative/Resident Engineer (RE)

MAWRD will appoint their own Employer's Representative, also called the Resident Engineer (RE), who will act as the on-site implementing agent and has the responsibility to ensure that the Employer's responsibilities are executed in compliance with relevant legislation and the ESMP. In addition to general project management, the RE has the responsibility to appoint the Health, Safety and Environmental Site Officer (HSE Site Officer) (see below).

Any on-site decisions regarding environmental management are ultimately the responsibility of the RE. The on-site RE shall assist the HSE Officer where necessary and will have the following responsibilities in terms of the implementation of this ESMP:

- Ensuring that the necessary environmental authorizations and permits have been obtained, via the MAWRD.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the HSE Site Officer where necessary.
- Ordering disciplinary action (e.g. disciplinary steps) against non-compliance which may lead to the removal of person(s) and/or equipment not complying with the ESMP specifications.
- Issuing fines for transgressions of site rules and penalties for contravention of the ESMP.
- Providing input into the HSE Site Officer's on-going internal review of the ESMP, this review report shall be submitted to the Employer.

Health, Safety and Environmental (HSE) Site Officer

The HSE Site Officer, who will also act as the Environmental and Social Safeguard Officer, will be a competent person appointed by the RE to implement, monitor, and review the on-site environmental management and implementation of this ESMP by the Contractor.

It is recommended that the HSE Site Officer is preferably recruited from the local community. The person is expected to have a part time role, with varied intensities of involvement commensurate with the construction progress and sensitivities on site. The person should have an Environmental and Occupational Safety related certificate or diploma and/or proven learned experience of HSE related matters on an

infrastructure construction site, confidence to enforce the HSE requirements, skills in verbal and written communication, and a proven work ethic.

The HSE Site Officer duties will include the following:

- Assisting the RE in ensuring that the necessary environmental and social authorizations and permits have been obtained.
- Maintaining open and direct lines of communication between the RE, Employer, Contractor and community with regard to environmental and social matters.
- Regular site inspections of all construction areas to monitor ESMP compliance.
- Taking appropriate action if the specifications are not followed.
- Assisting the Contractor in finding environmentally and socially responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental and social awareness training for all personnel coming onto site.
- Advising the RE on disciplinary action (e.g. disciplinary hearing) cases against non-compliance. This may lead to the removal of person(s) and/or equipment not complying with the ESMP specifications.
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the ESMP (via the RE). Section 7 of this report provides guidelines for fines and penalties. Fines are recommended for the contractor and not the individual worker. It is also recommended that first time transgressors are retrained before they are fined.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document. The continuous review of the ESMP is MAWRD's responsibility.

The Contractor

Before commencing with construction the RE will provide training on the ESMP to the contractor. Once this has been completed, the contractor shall be responsible for the implementation of the ESMP and its associated plans and procedures, onsite monitoring and evaluation of the ESMP.

The Contractor shall then ensure that adequate environmental induction (on the ESMP and Code of Conduct) takes place and that all construction workers receive

an induction presentation on the importance and implications of the ESMP. All attendees should sign off on the training once they've attended.

The Contractor is ultimately responsible for the compliance of the ESMP, and shall ensure that the dedicated employees, i.e. the RE and the HSE Site Officer, are competent and empowered to do their required HSE tasks.

External Compliance Officer (CO)

The CO is to be appointed by MAWRD, to implement compliance monitoring during the construction phase. The CO will undertake external compliance monitoring to ensure that the provisions of this ESMP are carried out during construction. Corrective measures will periodically be recommended by the CO, where there are deviations from the ESMP. The CO should attend the site meetings, which should be more regular during crucial periods of construction, usually at the outset when crucial decisions need to be made, then periodically, e.g. two-monthly. Monitoring reports shall be produced to the AfDB and the MAWRD.

3.3 During the operation and maintenance and decommissioning phases

NamWater will be the authority responsible for the operation and maintenance of the project, namely the operation of the water supply, including payment systems, and maintenance of the system, such as leaks, and faulty metres, taps, etc. This ESMP includes a section to ensure environmental and social management during this phase, and is to be integrated with NamWater's overall environmental and social management system.

The details of the decommissioning phase has not been worked out, therefore the direction for environmental and social management for this phase, provided in this document, is only indicative at this stage, and to be further considered and elaborated on, at that stage.

3.4 Environmental Awareness Training and Discipline

The Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the ESMP.

The presentation shall be conducted, as far as is possible, in the employees' language of choice. The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

If an employee is found violating the conditions of the ESMP, the first step of discipline is to subject the employee to a repeat of the training module by the Contractor and the direct Supervisor of the employee, which include a written warning that explains that fines may be given to an employee for violating the conditions of the ESMP.

Fines and penalties are given to the Contractor who must then comply and determine how to discipline his personnel internally.

As a minimum, training should include:

- Explanation of the importance of complying with the ESMP.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance, such as health and safety.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the specifics of this ESMP and its specification (no-go areas, etc.) and of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the ESMP.

3.5 Stakeholder Engagement

An ongoing process of stakeholder engagement shall be maintained to ensure the involvement of stakeholders in a meaningful way. For this project it would be prudent to have regular meetings with the Ministry of Environment, Forestry and Tourism, particularly representatives of the Mudumu National Park , the relevant conservancies, and the Zambezi Regional Council, as well as community leaders particularly where the project is actively implemented at the time of engagement, to discuss progress and any construction issues that may arise. Monitoring outcomes are to be shared with the community on a regular basis.

If a community matter arises, the Contractor must arrange a forum immediately to resolve the issue with the affected parties involved. These meetings shall be arranged by the HSE Site Officer, but shall be facilitated by the ER. A complaints register shall be held on site to deal with issues raised by stakeholders, according to the Grievance Redress Mechanism (Appendix A).

It is proposed that MAWRD take note of the following guidelines for continued communications during both the construction and operational phases of the proposed project (Table 1).

Table 1: Consultation Guidelines for MAWRD

ACTIVITY	METHOD
PRIOR TO CONSTRUCTION	
• Consult with the Constituency Councillor and community members in the project area regarding the construction time frame, how recruitment will take place, community safety issues, the process they have to follow to benefit from this new water scheme, i.e. the costs of water, etc.	• Community Meeting
• Communicate with the Regional and Constituency Councillors, and Traditional Authorities as to when the planned construction is to commence.	• In writing and at the meeting • Can also be announced over the radio
• Walk the proposed branch pipeline routes accompanied by representatives from the Constituencies and Traditional Authority of the area in order for them to physically see where the route will go. The detailed route is confirmed with the assistance of the Councillor and traditional headmen. This will assist in the Traditional Authorities not giving land to someone which may be in conflict with the proposed route, avoiding issues concerning compensation for damage to property. (confirm to the community that no assets of the community will be affected, that the pipeline will be routed to avoid such assets, trees, cultivated fields, etc.)	• Site visit to finalise route and branch route positions.
• Should cultivated fields be in the way, consult with the affected owners regarding the best time to construction the pipeline so to avoid loss of crop yields.	• Focal meetings
• Ask the assistance of nearby schools to inform their learners of the construction that will take place and associated safety risks, i.e. learners should be urged to stay clear of the construction site. • Warn them of the effects of HIV/AIDS.	• In writing
CONSTRUCTION PHASE	
• Inform the community about the grievance mechanism that is available to them and how this mechanism will function. • Keep the affected community members informed on the progress of the construction. • Employ community members in the construction of the pipeline with the assistance of the traditional headmen and Councillor.	• Direct employment • Constituency councillor to announce over the radio
OPERATIONAL PHASE (NAMWATER)	

ACTIVITY	METHOD
• Identify and introduce a go-to-person from each constituency/ community, who can be informed about any leakages along the pipeline route. This person should then in turn inform NamWater of such situations. • There should be a committee established, depending on the structure of communication and collaboration decided upon for this community at the outset. • Share all monitoring outcomes with this committee, who will have the responsibility to share such information with the community.	• Identity person at the community meeting • Telephonic or in writing

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3.6 Compliance monitoring and audit arrangements

The HSE Officer shall provide:

- Internal monthly ESMP implementation compliance reports to the MAWRD and AfDB.

The Compliance Officer shall provide:

- External quarterly ESMP Audit/Review reports to the MAWRD and AfDB.
- Bi-annual external ESMP compliance reports to the MAWRD and AfDB, which will be submitted to the MEFT Directorate of Environmental Affairs as part of compliance to the Environmental Clearance Certificate conditions.
- One final ESMP Closure Compliance report to the MAWRD and AfDB.

The compliance audit requirements are provided for the management actions in the tables to follow, including legal permit requirements.

4 SENSITIVE ENVIRONMENTAL AND SOCIAL COMPONENTS

The table below (Error! Reference source not found.) summarises the sensitive environmental and social components of the project and provides references to where these are described in more detail. These are areas where particular care needs to be exerted to avoid environmental and social impact specific to the project. Maps are provided in the Annexes for each component.

Table 2: Sensitive Environmental and Social Components

SENSITIVITY	LATITUDE	LONGITUDE	COMMENTS AND REFERENCE
Water abstraction point	-17.790181°	23.344380°	Riverine vegetation to be conserved. Prevent water pollution. Health and safety precautions at the water. See Section 4, Appendix A Biodiversity Management Plan.
Vegetation:			See Appendix A Biodiversity Management Plan. The zones represent areas where trees are located near the servitude, where careful planning and implementation is required for their conservation.
Zone 1	-17.847653°	23.377038°	
	-17.863175°	23.364480°	
Zone 2	-17.957643°	23.328810°	
	-17.969511°	23.324270°	
Zone 3	-18.021493°	23.344973°	
	-18.033234°	23.330487°	
Zone 4	-18.003852°	23.397569°	
	-18.043575°	23.354128°	
Zone 5	-18.188751°	23.500315°	
	-18.194245°	23.507605°	
Zone 6	-18.216691°	23.527644°	
	-18.223766°	23.520349°	
Zone 7	-18.239754°	23.832968°	
	-18.249668°	23.808687°	
	-18.249072°	23.823232°	
Archaeologically sensitive zone along the C49 road.	-18.181017°	23.894011°	This zone is not within the construction area. The contractor is to ensure that none of their activities, e.g. laydown area, accommodation, worker movements, etc. take place within this zone. See Appendix E for full information.
	-18.238616°	23.567307°	
Structure density along the route			Areas where structures are outside the construction servitude, but where careful planning and movement is required to avoid these structures. In case it is not possible to avoid a structure, compensation will be required. See Appendix D.
Medium density 1	-17.821873°	23.397739°	
	-17.857763°	23.369006°	
High density 1	-17.857763°	23.369006°	
	-17.897309°	23.345854°	
Low density 1	-17.967791°	23.323934°	
	-17.986017°	23.330859°	
Medium density 2	-17.986017°	23.330859°	
	-18.068042°	23.363921°	
Low density 2	-18.183463°	23.493221°	
	-18.237637°	23.564525°	

5 MANAGEMENT ACTIONS

5.1 Planning and design and tender preparation Phase

Goals:

- To ensure that mitigation measures aimed at avoiding impacts (i.e. design elements) are completed during the design.
- To ensure that the contractor is provided with all the information re`quired to comply with environmental and social provisions during construction.

Responsibility:

- Engineering Team shall consider and implement these aspects in conjunction with the MAWRD

Compliance audit requirements:

- This section of the ESMP signed off at the end of the planning and design and tender preparation phase, confirming that each of these steps have been completed.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
IMPACT ON RIVER FLOW AND WATER RESOURCE	To ensure the cumulative impact of all river projects on the Cuando River are considered and controlled	• Permit application to be made for the proposed abstraction of the water from the Cuando River. The chemical and physiological water monitoring requirements of the permit shall be implemented and reports submitted as prescribed. • All current and future projects to be considered and cumulatively assessed. No irrigation projects to be allowed on the Cuando River. • The water abstraction to be recorded and monitored for the River as a whole.	• Copy of permit application submitted • Approval of permit application • Record of cumulative assessment of water abstraction vs water resource. • Records of water abstraction figures available and updated, demonstrated to be within permit allowance.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
			• Water quality indicators monitored according to the permit, records kept and submitted as prescribed.
ALL CONSTRUCTION IMPACTS	To ensure the contractor is aware of the provisions of the ESMP and has the resources to carry them out to the satisfaction of the AfDB, MAWRD and MEFT.	• Include this ESMP with its appended plans, including the Health and Safety, Labour Management, Waste Management, and Biodiversity Management and Stakeholder Engagement Plan (including grievance redress mechanism), in the construction contract/s and ensure it is applicable to all sub-contractors. Ensure that the contractor/s demonstrate competency to fulfil all its requirements. Ensure that the ESMP as part of the contract document is signed.	• Instructions in the Construction contract to implement the ESMP with its relevant plans. • Signed Contract with ESMP. • Tender conference meeting to include instructions on ESMP implementation. Minutes show ESMP was discussed.
LOSS OF BIODIVERSITY	To optimise the routes in terms of avoidance of sensitive plant and animal habitat. To optimise the abstraction point to avoid loss of sensitive plant and animal habitat and to ensure unrestrained river flow.	• Align the route at 25m from the centre line, to avoid large trees. • Also consider the vegetation hotspot areas (Biodiversity Management Plan, Appendix A), and ensure these hotpots have been avoided as far as possible. Communicate to the Contractor, these areas, for more detailed deviations as appropriate. • Identify trees that are still in the way of the pipeline, mark these, and instruct the contractor to deviate the pipeline around these trees. • Instruct the Contractor to avoid all trees at the branch lines. • Create the abstraction point away from road culverts (i.e. 80 m upstream) where the flow is constant and the river offers a deep pool with no signs of	• Signed drawings showing the route at 25m from the centre line. • Written instruction to contractor of remaining trees to be avoided. • Drawings of abstraction point away from road culverts.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
		sedimentation. The abstraction point must be kept out of the main stream of the river to avoid obstruction to the flow. The inlet pipe must be buried deep enough to prevent damage during floods. The design must provide easy access for clearing vegetation from the inlet pipe.	
LOSS OF ASSETS OF THE AFFECTED COMMUNITY	To ensure zero affected assets including household structures, businesses and any other structures built in the road reserve or along the branch lines.	• Align the route 25m from the centre line. Confirm that all the structures, as per the Resettlement Action Plan, Have been avoided or can be avoided by the Contractor. • Instruct the contractor to ensure there are no assets affected, along the main pipeline along the branch lines. • Contractor is to make minor adjustments to the pipeline route, to avoid such structures. • The pipeline route should be at least 5m from the foundations of any structure and 2.5m from fences. • Tender document should clearly state that construction of the pipeline in areas used for cultivation should take place between May and October so as not to interfere with seed-time and harvest.	• Signed drawings showing the route at 25m from the centre line. • Written confirmation, no community assets affected, and 5m from foundations of any structure and 2.5.m from any fences. • Written instruction in tender – construction between May – October at cultivated fields.
POVERTY ALLEVIATION AND GENDER EQUALITY	To ensure that the project renders the maximum level of poverty alleviation possible, and to promote gender equality in economic opportunities. Optimise local service and	• The contractor should be instructed to follow the attached Labour Management Procedures (Appendix B). • The Contractor shall demonstrate how local labour and at least 50% women will be employed from each community. • Structure the contract to ensure the various components of the project optimally benefits local contractors and SMEs.	• Singed Labour Management Procedures • Employment records show 50% females • Tenderers required to include local SMEs/contractors. • List of contractors demonstrate local contractors

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
	contractor procurement.		and SME's are included.

5.2 Site Establishment Phase

Goals:

- To ensure that the mitigation measures, which are aimed at avoiding impacts during site establishment, are implemented.
- To ensure environmentally and social responsible choices and actions are performed during site establishment.

Responsibility:

- Contractor shall perform these measures, to be monitored by the RE and HSE Site Officer.
- MAWRD shall ensure that compliance monitoring is successfully carried out, through the appointment of an external compliance officer (CO).

Compliance audit requirements:

- This section of the ESMP signed off at the end of site establishment, confirming that each of the measures have been implemented. Construction Phase dependent on this action.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
MANAGEMENT AND MONITORING OF ALL MITIGATIONS TO LIMIT IMPACTS	To ensure that the provisions of the ESMP are implemented during construction.	• The contractor will appoint an HSE Site Officer to ensure that all aspects of the ESMP are implemented during construction. The HSE Site Officer shall attend all site inspections and meetings and minutes shall make provision for reporting on every aspect of the ESMP. • MAWRD shall ensure that an external compliance officer (CO) will report performance to the MAWRD The CO will report monthly on ES compliance on the project, and submit six-monthly monitoring reports, which shall, also be submitted to the MEFT as part of the ESMP requirements.	RE, Con, during construction preparation phase • HSE Site Officer Appointed • Reports available. • CO Appointed • Compliance monitoring reports received
COMMUNICATION AND STAKEHOLDER CONSULTATION	To ensure that all stakeholders are adequately informed throughout construction and that there is effective communication and problem solving with and feedback to all stakeholders.	• The HSE Site Officer will be the liaison person between the Contractor, community, client, and consultants . • The Contractor must list the stakeholders of the Project and their contact details, with whom communication would be required throughout the Contract. This list, together with an indication of how stakeholder communication will be done throughout construction must be agreed upon and given to the ER before construction commences. • All communication with the stakeholders must take place through the HSE Site Officer. • The Grievance Mechanism (Appendix C) must be implemented by the contractor. • A copy of the ESMP, Code of Conduct (Appendix B) and Grievance Mechanism (Appendix C) must be given to	RE, Con, during construction preparation phase • Site meeting and stakeholder meeting minutes received. • List of stakeholders received and minutes of stakeholder meetings received. • Singed records of grievances, with redress details.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
		all stakeholders, who must be invited to raise any concerns and issues and the project progresses, using the procedure in the Grievance mechanism. • The Contractor shall inform the Regional Council and the Directorate of Wildlife and National Parks ,as well as representatives of the Mudumo National Park and application conservancy leaders and traditional leaders, two weeks before construction commences on the project programme and they shall be regularly kept up to date with the programme. • A register will be kept where all complaints received from the public and other stakeholders should be recorded. • The register should be under the authority of the RE. • A sign off procedure should be in place to address any concerns raised. • Management measures to address the complaint should be indicated in the register. • The register will be the responsibility of the HSE Site Officer , who shall submit the state of such at each site meeting.	
IMPACTS RELATED TO ACCOMMODATION AND CONSTRUCTION SITE ESTABLISHMENT	To ensure that living conditions of workers is not hazardous to their health or safety.	• The Contractor must establish a: • Construction camp consisting of an equipment and storage facility for the storing and servicing of construction material and equipment. • An accommodation camp in case such is envisaged for the staff not from the local community (such staff may also	RE, Con, during construction preparation phase • Minutes of meetings with traditional leaders confirming site localities.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
		be accommodated at an existing lodge, or self-catering facility in the project area). • Materials storage sites. • For these sites, the Contractor should liaise with the traditional leaders and the regional council, for suitable sites. The sites should preferably be on disturbed terrain, be away from flooded, drainage, river banks or any area where vegetation will be damaged. All sites should be sited along existing main roads. • All of these camp sites should be fenced off separately. • All the sites should have adequate chemical toilets, for males and females and with washing basins. • All sites should be checked and approved by the HSE Site Officer and the CO. • No servicing of any construction vehicles or equipment will be allowed on the construction site. • No Construction, accommodation or materials site will be allowed in a National Park.	• Fenced off confirmed. • Toilets according to ESMP, clean, in good working order, complaint free. • Sites signed off by HSE Site Officer and CO.
JOB CREATION, ECONOMIC UPLIFTMENT, SPREAD OF LOCAL DISEASE, INCREASE OF SOCIAL ILLS INFLUX OF PEOPLE,EXPLOITMENT OF PEOPLE	To ensure that recruitment takes place in a legal and fair manner and so minimise conflict. To minimise the spread of disease, social problems, influx of people through making use of the local workforce in their local context and	• Adhere to the legal provisions for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc) in the Contract, implemented the attached Labour Management Plan (Appendix B). • The recruitment process must be formal and organised in accordance with the relevant legislation, i.e. the Labour Act. • Get assistance from the Regional Council and headman to announce the recruitment	RE, Con, during construction preparation phase Documentation to prove Labour Management Plan is implemented. Minutes of meeting with Regional Council. Contracts with labourers, and minutes to show the contents were

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
	culture as far as possible.	process for the project amongst the communities. • Do not recruit at construction sites. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. • Contractors are to recruit all unskilled labour from the local communities, employing staff where they already live with their families per section in the area where the contract is being implemented. • Inform job seekers that they are hired for a contract period only and spend time to make sure that they understand all other conditions of contract. • Contractor to ensure all requirements regarding Health and Safety procedures, PPE, and requirements according to the Health and Safety Regulations are in place.	explained to them, with appropriate translation. % of unskilled labourers from local community.
BIODIVERSITY LOSS THROUGH PLANNING OF THE ACCESS TRACK	To minimise habitat loss at the access track	• No new access tracks will be constructed since the existing roads and tracks follow the pipeline routes. • The large interlink trucks that deliver the pipe material may not use informal tracks. All materials must be stored at the Construction Camp or along the designated storage sites along the district road/main road (see ACCOMMODATION AND CONSTRUCTION SITE ESTABLISHMENT). From here, the materials may only be transported by light trucks/vehicles along the pipeline route.	RE, Con, HSE during construction preparation phase • Check access tracks against ESMP. • Drivers to sign upon their training. • Inpections of tracks and access roads. • Inspection and sign off on rehabilitation of tracks.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
		• All drivers will be made aware of the sensitivity of the environment and need to keep to the existing roads. A 30km/h speed limit must be imposed on any informal track. • The track must be restored to its natural state after construction.	
BIODIVERSITY LOSS, AND LOSS OF RESOURCES ON CULTIVATED FIELDS, ALONG THE ROUTE	To protect specific species of vegetation, especially large, protected and fruit bearing trees.	• Adjust the route to avoid all trees as far as possible. • Where trees cannot be avoided, this should be recorded, with a photo and identification of the tree, and reason for proposed removal. The approval of MEFT, the community leader and/or the necessary permit to harvest protected species must first be obtained (from the nearest forestry office) and recorded by the HSE Site Officer. Trees removed by the Contractor for which approval has not been granted or which has not been recorded will be fined (See Section on fines). • Trees to be removed and used by the community should be compensated according to the Compensation Policy. • Do not remove any tree within 100 m from the riverbed and do not create new access point to the river bank. This is to protect sensitive riparian forest vegetation. • Discuss the construction programme with the community leader and the community members which may be affected by the pipeline crossing their fields. Adjust the pipeline construction schedule to allow farmers the effective use of their field or compensate as required for the loss of crop during the season.	RE, Con, during construction preparation phase • List of coordinates and species name of all trees, with conservation status. • Marked which trees are approved for removal by RE and HSE Site Officer. • Marked which trees are to be compensated. • Records of compensation completed. • Minutes of meetings with community confirmed construction schedule, any potential cultivated fields affected and how this is to be avoided.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS FOR MONITORING AND EVALUATION
UNSFE ORDINANCE	To identify and avoid unexploded ordinance from the Liberation War Era and later activity.	• Contact the Regional Commander of the Namibian Police Force in Katima Mulilo to further advise the contractor once details of the project establishment and the construction activities are available on drawings.	• Minutes of the meeting with the Regional Commander. • Markers placed by the police if necessary on drawings and maps.

5.3 Construction Phase

Goals:

- To ensure that the mitigation measures, which are aimed at managing impacts during construction, are implemented.

Responsibility:

- Contractor shall perform these measures, to be monitored by the RE and HSE Site Officer.
- MAWRD shall ensure that compliance monitoring is successfully carried out, through the external compliance officer (CO).

Compliance audit requirements:

- This section of the ESMP signed off with individual records, as specified per the Smart indicators.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
ALL IMPACTS EMPLOYEE AWARENESS RAISING	To ensure that the entire construction workforce is aware of the provisions of this ESMP and the reasons for enforcing them.	• All staff will receive an induction course prior to commencing work. The HSE Site Officer must discuss the ESMP and Code of Conduct (CoC) with all employees and make sure that all understand the contents and importance thereof. Native language to be used as applicable. • The employees must be explained why this ESMP is being enforced, i.e. the need to protect the environment. • Constant reinforcement is crucial. • New employees who join the project later must receive an induction course before they commence with work. • Acknowledgement of attending the induction course and understanding the contents of it must be signed off and the attendance register kept on record. • Personnel performance appraisal must include environmental and social compliance issues.	RE, Con, HSE during site establishment and start of employment, monthly reinforcement. • Signed induction coarse for each employee. • Attendance register. • Personnel performance appraisal includes HSE content.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
IMPACTS ON COMMUNITY AND EMPLOYEE HEALTH, SAFETY AND SECURITY	To aim for zero incidents and accidents on the construction site (employee and community). To ensure there are emergency response procedures in place in case of incidents and accidents. To ensure security measures are in place to protect property and life for the duration of the contract.	• Visitors should be made aware of the fact that they will be required to wear the necessary PPEs (Personal Protective Equipment) on site. • The Contractor must ensure the least possible disruption to traffic and potential safety hazards during construction. The Contractor must liaise with the local Traffic Authorities for the compilation of a Traffic Management Plan, for their approval. • Proper traffic and safety warning signs must be placed at access points to the construction sites to the satisfaction of the Engineer and the Roads Authority. • The Contractor must adhere to the regulations pertaining to Health and Safety of the Labour Act, including the provision of protective clothing. Failing to adhere is a criminal offence. • The contractor must enforce relevant Health and Safety Regulations for all work related activities. • Provide a health awareness programme (including communicable and non-communicable disease) to all staff, soliciting the help of a	RE to review and approve plans and procedures at project inception before start of construction. Con provide plans and procedures before start of construction and distribute resources and maintain capacity during construction. HSE to review and record compliance on weekly basis. Provide external incidence records on monthly basis. • Procedure for PPE discussion with visitors documented. • Traffic Management Plan submitted and approved by Traffic Authority. • Accidents and Incidents records. • HSE Reports. • Tool talks • PPE issued and used. • Health awareness programme in place (per records) • HSE signs on premises and along the project, particularly where trenches are open. • Inspect trenches - cordoned off, visible by community, no long distances left open. • Check First Aid Kit and personnel trained to use it. • Check fire extinguishers present. • Emergency preparedness plan in

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		suitable NGO working in the region. • Provide access to condoms to all construction workers. • Make sure that all staff are equipped and know how to use safety and personal protective equipment (PPE). This includes goggles, ear plugs, dust masks, steel-toed shoes, gloves, overalls, etc. • The use of PPE must be enforced. • Signage indicating the use of PPE will be erected at appropriate locations. • Hazard identification signage should be erected at appropriate locations. • Limit open trenches to sections that can be completed in 2 days. Cordon the open trenches off to ensure no entry by the community. • Implement safety training and precautions for workers operating at the abstraction point, including • Keep a comprehensive first aid kit at all construction points. • All items for treatment as specified in the material safety data sheets for hazardous materials should be	place, including listed items. • Record issuing of PPE and review PPE use daily before work starts. • Monitor types of signs are in place. • Monitor and record trench management and that signs are in place. • Training records. • First aid kit content, training and distribution records. • Incidence records and compliance to ER plan records and reporting to authority. • Records of river PPE use and safety assessment. • Incidences of alcohol used, speeding, movements outside the site, and other contraventions against disciplinary actions taken. Number of repeats per employee (indication that discipline and training is ineffective). • Check drivers licences are with drivers and legal before driving. • Review traffic requirements with drivers monthly • Vehicle road worthy checks on monthly basis and records. • Site visitor record.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		available in the first aid kit. • Ensure that all staff know where the first aid kits are located and who is trained in first aid. • At least one person should be available on each site that is trained in first aid. • All injuries and near miss incidents will be reported to the ER and recorded in a Health and Safety report to be submitted to MAWRD on a monthly basis. Measures to prevent recurrence will be implemented and included in the monthly report. • The contractor shall have an emergency response plan, which shall at least cover large spills, vehicle accidents, injuries on site, accidents at the river, including slips, falls, people caught in the current, and crocodile encounters. • Workers to be involved at the river construction site, should be provided with life jackets and emergency equipment for a rescue procedure, and trained to safely work near water, buoys should be fitted in case of strong currents. All applicable workers should be made familiar with the	

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		rescue procedure at the water, and an appropriate number of workers trained to perform the rescue. • Crocodile safety procedures should be in place for the workers operating at the river site. • The river construction site should be cordoned off so that the community does not have access to it. • Establish an emergency rescue system for evacuation of seriously injured people. • Emergency procedures for accidents should be communicated to all employees. • Emergency facilities are available at Katima Mulilo, (police, and hospitals). Emergency telephone numbers should be prominently displayed in the site office as well as outside of the site office. • Contact details of the resident engineer and the second in charge must be forwarded in writing to the Katima Mulilo Local Authority. • No alcohol/drugs are allowed on any site and anyone found to be under the influence of alcohol/drugs will be disciplined.	

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		• All drivers must adhere to traffic regulations at all times. No speeding shall be allowed. • The speed limit at the construction sites will be 30km per hour. • Make sure all drivers/operators have licenses for the vehicles/equipment they are driving. Copies of these records must be kept on file and must be accessible for inspection. • Fire extinguishers should be readily available at the construction site office. Staff members from the construction team must be designated and trained to handle emergency situations such as fires, and trained to handle the necessary emergency equipment. Fire extinguishers must be available at all high risk areas. Staff should be trained to handle such equipment. • Emergency procedures must be in place for incidents and accidents on site and staff trained in these procedures. • Indiscriminate walking outside the construction zones must be avoided. The maximum area to be used for construction	

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		should be demarcated. • It is important that the necessary precautions be taken to protect property against theft. • Nobody will carry any firearm, or store it in his vehicle or at the construction site. • No night driving is allowed. If night driving is required, a safe arrival confirmation system should be implemented. • Dangerous areas , particularly open trenches must be clearly marked and access to these areas controlled or restricted. • All visitors must report to the site office before entering the construction sites. No visitors will be allowed on site without the permission of the Contractor. • Train people who handle fuels in the correct procedure / technique to transfer fuels. • Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts etc. immediately. • Cooking places should be located at a safe distance from fuel / explosives storage areas and vehicle parking sites.	

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		No cooking will take place and no fires will be lit on the construction site. • Smoking is prohibited in areas where it is a fire hazard, e.g. fuel storage areas, workshops, etc. • Remind personnel that the project takes place in a National Park (Mudomo National Park)/Conservancy area/area with abundant wildlife and that wildlife will be active in the project area. Wildlife will have right of way at all times.	
IMPACT ON COMMUNITY ASSETS (STRUCTURES AND CULTIVATED FIELDS)	To keep communication channels open between the contractor and the community.	• At the outset (i.e. before commencement) of the construction programme, consultations will have to be held with all land and property owners along the route, in the presence of constituency councillors (see site establishment phase). The community should be made aware that the contractor has a full record of the existing structures in the area. • The pipeline route has been placed to avoid ALL structures in the road reserve, and the Contractor will have instruction to make minor adjustments where necessary to achieve this.	RE, Con and HSE to provide ad-hoc records. Minutes of consultation meetings with community. Compensation records (Appendix D forms completed and filed). Grievance forms and solutions recorded and filed. Before start of construction and then at required intervals

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		• In the unlikely event that a structure and/or field or other asset of the community is affected, with no other alternative available, the procedure in Appendix D Should be followed. • Where project affected people are inconvenienced, but their livelihoods are not affected materially, other forms of assistance, as in the form in Appendix D, may be negotiated. • Written records of permission requisition from project affected persons must be created and kept before any removal of such property can commence. • It should also be stressed that no homestead that has been built on the pipeline route after it has been surveyed and communicated, nor after it has been constructed, will be compensated for. • A community grievance mechanism (Appendix C) , must be set up by the contractor and be accessible to the public and also be used in cases of compensation related grievances. The register must provide for feedback	

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		and actions taken to investigate and rectify the complaint, as well as how the process was communicated to the community. The register will be inspected on a monthly basis.	
IMPACTS ON BIODIVERSITY	To minimise damage to soil, vegetation, habitat and heritage resources during the construction phase.	• Implement the Biodiversity Management Plan (Appendix A).	RE, Con, HSE, MEFT Targets listed in BMP. Monthly monitoring reports to include Biodiversity inputs.
DAMAGE TO/DESTRUCTION OF ARCHAEOLOGICAL SITES	To prevent damage to or destruction of grave sites and archaeological sites.	• Appendix E indicates the archaeological sites identified in the vicinity, but not on, the pipeline route. • The contractor should be aware of this area, and should avoid all movement and access to this area. • The chance- find procedure in Appendix E should be followed in case an archaeological find is made along the route. • The local headman should be consulted regarding any possible grave sites where the branch lines are planned. In case such a site is located, it should be marked with a 5m buffer around it, and the pipeline shall be deviated around this area. No movement or access shall be	RE, Con HSE, Heritage Council. Before construction start and records in incident takes place. Contractor is to be made aware of archaeological site localities and is avoiding the area where possible. Training of workforce includes Chance Find Procedure. Records of information sharing session. Training records.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		allowed within such a grave site area.	
HABITAT DESTRUCTION AND DUST THROUGH ROAD CREATION AND DRIVING	To ensure the proliferation of roads are kept to a minimum, so as to avoid unnecessary damage to the fragile floodplains. To ensure that track discipline is maintained at all times by the entire construction team. To minimise amount of dust generated.	• As far as possible existing tracks within the present servitude should be utilized. These should be clearly marked. • Erect signage at the access points to warn motorists about construction activities and heavy vehicle movement where appropriate. • Do not create new roads when the quality of existing roads deteriorates. Where possible, repair or upgrade existing roads. • Prevent cutting of corners. Demarcate areas that are prone to corner cutting so that this is avoided. • Activities causing dust should be limited along access roads by keeping to the driving speed (30km/hr) on all tracks. • When applicable, vehicles driving along the service route should engage four-wheel drive to prevent excessive track making. • In order to promote visibility and communication between drivers (and prevent accidents with consequent environmental impacts) vehicles	RE, Con and HSE. Continuous and monthly reports. Check sites for unnecessary tracks and record. Check rehabilitation of tracks post-construction. Constant supervision undertaken. List of materials sources and their localities. Ensure all borrow pit sites have ECC approval.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		should always be driven with their lights on and indicators should be used as normal. • Use 3-point turns and not U-turns. • Prevent shortcuts between roads. • Tyre pressures should be as low as possible to reduce impacts. • All construction materials to be sourced outside the park and conservancies. Borrow Pits, if created for the project and not sourced from an existing approved site, require separate environmental clearance. Sites for sourcing construction material to be approved by the HSE Site Officer and RE. • Roads no longer in use should be rehabilitated immediately. (See Rehabilitation section).	
POLLUTION AND HEALTH RISK DUE TO EXPOSURE TO HAZARDOUS SUBSTANCES	To manage the handling and storage of hazardous chemicals to avoid pollution and exposure by humans.	• Adhere to the procedures in the Waste Management and Pollution Prevention Plan (Appendix F)	RE, Con and HSE Continuous and at monthly reports, incident reports. RE to approve WMPPP of contractor Waste and pollution incidents to be included in reporting. Records of storage, pollution incidents, submitted to RE monthly.
WASTE MANAGEMENT	To avoid potential	• Adhere to the procedures in the	RE, Con and HSE

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
	surface and groundwater pollution. To ensure that sound waste management practices are adhered to during construction.	Waste Management and Pollution Prevention Plan (Appendix F).	Continuous and at monthly reports, incident reports. Waste and pollution incidents to be included in reporting.
WATER WASTAGE	To manage the use of the water resource in a responsible manner and to conserve water where possible.	• The contractor shall submit a water use plan to the RE for approval. The contractor shall utilise water only as specified in the approved water use plan for the project (Appendix F). • Water will be used sparingly and all faulty and leaking taps, toilets and pipes shall be immediately repaired.	RE, Con and HSE Continuous and at monthly reports, incident reports. RE approve Water Use plan of Con. HSE to coordinate records of water leaks and spills and repairs, to be included in reporting.
TERRAIN DISTURBANCE, ECOSYSTEM DECAY, POLLUTION, WASTE.	Re-establishment of pre-disturbance form and ecological function (soil crusts, plants and animal burrows)	• Rehabilitation should be done in the following manner: o Compacted areas can be ripped by using picks and rakes, avoiding parallel furrows that will promote erosion. o Ripping should occur to full rooting depth. o The disturbed area should be remodelled to, as far as possible, resemble previous conditions and fit in with the adjacent landscape. o Return the stockpiled topsoil as the last 150 mm layer of backfill	RE, Con, CO and HSE Hand-over/approval of sections constructed. Rehabilitation inspection to be carried out before final payment. Rehabilitation works to be signed off by the RE and the External Compliance Officer.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		on the pipeline trench. Do not compact this layer. o Soil and gravel should be raked from adjacent areas to try and recreate the same texture and look as surrounding areas. Stones should be redistributed with rakes so that the surface texture resembles the surroundings. o In order to prevent re-disturbance of rehabilitated tracks, physical barricades (e.g. rocks or sign boards) should be implemented as an interim deterrent.	
DISTURBED TERRAIN, DERELICT FACILITIES, POLLUTION	To rehabilitate the site office, work sites, servitude areas, tracks and other areas disturbed during construction as close to their original state as reasonably possible.	• All equipment, waste, temporary structures, stockpiles etc must be removed from the work sites. • Alien vegetation particularly the Downy thorn apple (*Datura innoxia*) and Wild tobacco (*Nicotiana glauca*) that occur in the project corridor must be weeded. • Final payment will not be issued unless the RE and external compliance officer are satisfied with the obligations listed under this section ("rehabilitation"). Outstanding environmental issues should be integrated into a final snag-list, on	RE, Con, CO and HSE Handover/approval of sections constructed. Records of areas cleared of alien invasive species. Rehabilitation inspection to be carried out before final payment. Rehabilitation works to be signed off by the RE and the External Compliance Officer.

IMPACT ADDRESSED	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	SMART INDICATORS/MONITORING REQUIREMENTS
		which the final payment will depend. • Main contractor should be held responsible for all unnecessary damage due to non-compliance, whether caused by his/her company or by subcontractors.	
POST-REHABILITATION MONITORING	To ensure successful rehabilitation	• During the first month of rehabilitation, monitoring is very crucial and it is recommended that the HSE Site Officer visit all rehabilitated sites. During this visit, the Site HSE Officer shall check for any signs of erosion and check the progress on re-establishing the surface vegetation.	RE, Con. Post-construction monitoring report submitted and possible follow-up implemented.

5.4 Operation and Maintenance Phase

Goals:

- To ensure that the mitigation measures, which are aimed at managing impacts during operation and maintenance phase, are implemented.

Responsibility:

- Namwater's Appointed Environmental and Social Officer (ESO)

Compliance audit requirements:

- This section of the ESMP signed off with individual records, as specified per the Smart indicators.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	COMPLIANCE MONITORING REQUIREMENTS
CONTINUITY OF SOCIAL AND ENVIRONMENTAL MANAGEMENT	To ensure continuity of environmental and social management actions once the pipeline is operational.	• NamWater should apply a policy/guidelines on how to deal with defaulters and communicate to water users how defaulters will be dealt with. • The ESO shall include particular aspects and impacts related to this project into NamWater's overall Environmental Management System. • The ESO shall provide NamWater staff with appropriate guidelines for environmental and social management during operation of the pipeline, including: o All relevant provisions contained in the "construction" ESMP such as keeping grievance mechanism with complaints register, sound disposal of hazardous and general waste, track discipline, health and safety precautions, etc. o The ESO will design a record system for environmental, health and safety incidents and	MWARD, NamWater, RE Signed off defaulting policy – set baseline defaulting figures, aim for decreasing defaulting figures. Project Incorporated in NamWater ESMS Record system for environmental and social incidents and accidents during operation. Bi-annual inspections. Relevant staff adequately trained in environmental and social matters. Records of environmental and social incidents and

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	COMPLIANCE MONITORING REQUIREMENTS
		accidents along this pipeline. o The ESO shall inspect the route at least twice annually to inspect any environmental issues of concern.	accidents – align with corporate indicators.
COMPENSATION	To ensure that any agricultural losses incurred as a direct result of repairs to the operational pipeline are duly compensated.	• If maintenance and fixing of leakages are to occur during the crop growing season, crop losses must be compensated for in kind or in cash, according to the Compensation Procedures, (Appendix D).	MWARD, NamWater, Records of compensation.
HAZARDOUS CHEMICAL MANAGEMENT	To avoid potential chemical / hazardous substance pollution	• Designated areas for the storage of potentially hazardous material will be lined with concrete and secured. The bunded area will be of adequate capacity to contain 1,5 times the volume of the hazardous material to be stored in the bunded area.	MWARD, NamWater Check storage areas for compliance. Zero Hazardous substance pollution incidents.
GRIEVANCE MECHANISM	To ensure communities and stakeholders have access to competent people to address concerns, and that their concerns are satisfactorily redressed.	• The grievance mechanism in Appendix C is also to be implemented by NamWater and integrated with NamWater's overalls grievance mechanism.	MWARD, NamWater Grievance reports – 100% redressed.
WATER MONITORING	To ensure water quantities abstracted and water quality indicators are monitored according to the permit issued by MAWRD.	• The water abstraction permit water abstraction indicators are to be monitored at the intervals and locations prescribed, at the water abstraction point and other locations as prescribed. Water volumes abstracted are to be monitored. These records are to be kept according to a	MWARD, NamWater Monthly monitoring reports and submitted to fulfil the permit requirements.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	COMPLIANCE MONITORING REQUIREMENTS
		determined records management system of the MAWRD. • These reports are also to be submitted to the MEFT to fulfil the bi-annual monitoring reporting requirement (see below).	
ECC BI-MONTHLY MONITROING REPORTS	To ensure the bi-annual monitoring reports are submitted to the MEFT, and the ECC is renewed every three years.	• Bi-annual monitoring reports are to be submitted to fulfil the condition of the ECC, together with any other conditions to be provided in the ECC.	MWARD, NamWater Bi-annual monitoring reports.

5.5 Decommissioning Phase

Goals:

- To ensure that the mitigation measures, which are aimed at managing impacts during decommissioning phase, are implemented.

Responsibility:

- Namwater's Appointed Environmental and Social Officer (ESO)

Compliance audit requirements:

- This section of the ESMP signed off with individual records, as specified per the Smart indicators.

COMPONENT	TARGET	MANAGEMENT/MONITORING MEASURES	AUDIT REQUIREMENTS
DECOMMISSIONING	To ensure that the project does not have cumulative negative effects after completion of the pipeline.	• The applicable engineering team is to issue the specifications of the decommissioning. An impact assessment is to be carried out based on these specifications. The environmental and social management procedures are to be adapted, based on these specifications, including whether the pipeline will be removed, the future of water supply and the transitioning effects of this on the receiving population, etc. • No waste may remain on site after completion of the project. • Eradication of all exotic or invasive plants that occurs along the water pipeline route should be conducted before decommissioning. See Appendix A for a list of common alien species. • The applicable provisions of the ESMP (Construction with the applicable plans in the appendices) are to be	MWARD, NamWater, RE Inspection-post decommissioning. Compliance report signed. Post-decommissioning monitoring report submitted.

		adhered to during decommissioning. • All areas used during the construction (haul roads, site offices, etc) should be cleared and inspected for decommissioning approval. • Decommissioning should take place between May and October so as not to interfere with seed-time and harvest. • Post-decommissioning monitoring is to be carried out by the NamWater ESO and a report submitted confirming compliance.	

6 INSTITUTIONAL CAPACITIES AND STREGHNTENING PLAN

6.1 MAWRD

The MAWRD has limited capacity to implement the project, lacking in the area of project management, contract management and financial processing and administration, based on experience of consultants currently procured on this project. Processing delays are significant, and this is a significant deterrent to attract competent contractors. Furthermore, there is a need for MAWRD to become familiar with the specific requirements of the AfDB for the implementation of the project.

It is recommended that MAWRD identify the parts of the system where these delays and inadequacies occur, and implement re-structuring and training campaign as identified.

6.2 CONTRACTOR AND RESIDENT ENGINEER

The current engineering team is considered competent to manage the contract. It is recommended that the team be supported in understanding the details of this ESMP, which is more elaborate than the usual EMPs according to Namibian legislation.

It is important that the contractors are sufficiently made aware of the rigorous environmental and social requirements of this project, and that they be supported through awareness meetings during the tendering process. Tender requirements should explicitly include environmental and social matters. The winning bidder should be supported to understand and interpret the ESMP.

6.3 CO AND SITE HSE OFFICER

Namibia has a shortage of experienced and trained positions in this regard. It is recommended that the services of a consultant be solicited to train the people appointed for this purpose.

6.4 THE WORKFORCE

Due to the relatively large percentage of unskilled labour on this project, it should be expected that the workforce will largely be unfamiliar with HSE requirements and training will therefore need to be very rigorous in this regard. The contractor will have

to be geared to provide such training and demonstrate how the training will be offered in the tendering process.

7 COSTS RELATED TO THE IMPLEMENTATION OF THE ESMP

The following cost estimations are preliminary and are not necessarily accurate at the time of implementation, and may vary from region to region, and are dependent on market conditions. It is therefore important that each role player ensure that their parts are accurately costed at the time of implementation.

7.1 Planning and Tender Preparation Phase

The following item is an estimation, but is to be costed by the applicable institution/contractor.

Item	Unit	Frequency	Total (N$)
ESMP Review and prepare for inclusion in contracts	3 Days	Once	24,000.00

Other costs of this phase are already part of the Scope of Work of the Engineering Team.

The MAWRD should cost the strengthening plan for their capacity building of the team, although such costing falls outside of the scope of this ESMP.

7.2 Construction Phase

The Contractor needs to cost the applicable requirements of this ESMP and include such in the tender BID. The below table provides an example of items to be costed that are specifically aimed at environmental and social management. These are

The planning currently commits to 100% avoidance of community assets, therefore zero compensation costs. However, such a provision is recommended as below.

Item	Unit	Frequency	Total (N$)
ESMP Copies, site notices, posters, etc.	Lump	Prior to construction and replacements	50,000
Appointment of a part time HSE Site Officer (18months)	Monthly salary	18 months	180,000
Compensation and potential resettlement assistance	Lump		450,000
Appointment of an external compliance officer (CO) (tri-monthly monitoring and site visits, including travel and accommodation):	Site visit	Three-monthly	250,000
External audit	Post-construction	Once	48,000
HSE Training at induction at three-monthly follow-ups. (Follow-ups by HSE Site officer)	Training package	Induction, once	40,000
Stakeholder engagement, including information sharing budget, refreshments at meetings, travelling, and grievance mechanism tools)	Monthly allowance (4 focal meetings per month)	Monthly	*5,000*
Tree conservation – survey, GIS Work, physical marking	Lump	Once	*50,000*
Sundry items for construction camp, including fencing, chemical toilets, excl. chemicals and cleaning.	Toilets, fencing for sites.	Once	*20,000 per toilet. 500/m fencing.. Depends on numbers of teams, sites, etc. to be costed by the Contractor.*
Community and employee health and safety, including signs, PPE, first aid, fire extinguishers.	Per person	Once, lump	*2,500*
Health programme (to be facilitated by NGO)	Per person	Once	*500*
Rehabilitation	Manual labour, earthworks, clean-up, etc.	Once	*To be costed by Contractor, depending on areas disturbed.*
Pollution clean-up kits	Kit	Once	*2500*
Waste disposal	Cubic metres general waste	Monthly	*600*

7.3 Operation and Maintenance and Decommissioning phases

It is expected that the E&S requirements for the operation and maintenance phases will be absorbed under the existing ESMS of NamWater. Some items to be included in the operational budget include:

- Water abstraction monitoring, to be performed by NamWater/DWA personnel.
- Compilation of bi-annual monitoring reports. If sub-contracted to a consultant from the region, this is estimated at N$ 20,000 per report.

- The grievance mechanism, which is part of the overall operational budget for NamWater.

The Decommissioning phase should be costed at the time of planning and implementation.

8 IMPLEMENTATION SCHEDULE

The implementation of this ESMP runs parallel to the implementation of the project determined by the Engineering Team. Milestones are dependent on the implementation milestones, namely tender preparation, tendering, construction mobilisation, construction, and operation and maintenance. Environmental and Social management measures for each of these phases have been provided in this document and should be integrated with the overall project management.

9 NON-COMPLIANCE

9.1 Procedures

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ER to impose a penalty. In the event of on-compliance the following recommended process shall be followed:

The ER shall issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the Site HSE Officer.

The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a reasonable period that may be specified within the notice.

The Contractor shall provide the ER with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the Site HSE Officer.

In the case of the Contractor failing to remedy the situation within the predetermined time frame, the ER shall impose a monetary penalty based on the conditions of contract.

In the case of non-compliance giving rise to physical environmental damage or destruction, the ER shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.

In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP, etc. any party shall be entitled to require that the issue be referred to specialists for determination.

The ER shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

9.2 Offences and Penalties

Any avoidable non-compliance with the conditions of the ESMP 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 entrance into no-go areas;

Unauthorized damage to natural vegetation;

Unauthorized camp establishment (including stockpiling, storage, etc.);

Hydrocarbons / hazardous material: negligent spills / leaks and insufficient storage;

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 spillage / contamination;

Insufficient fire control and unauthorized fires;

Preventable damage to water courses or pollution of water bodies; and

Non-induction of staff.

9.3 Fines

Fines will be issued for the transgressions listed below. Fines may be issued per incident at the discretion of the ER. Such fines will be issued in addition to any remedial costs incurred as a result of noncompliance with the ESMP. The ER 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 ER 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$4,000
Any vehicle driving in excess of designated speed limits	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 walking outside the demarcated boundaries of the site	N$500
Persistent and un-repaired oil leaks from machinery.	N$3,000
Litter on site.	N$1,000
Deliberate lighting of illegal fires on site.	N$ 5,000
Individuals not making use of the site toilet facilities.	N$1,000
Dust or excess noise on or emanating from site.	N$1,000
Any person, vehicle, item of plant, or anything related to the Contractors operations causing a public nuisance.	N$2,000

For each subsequent similar offence the fine may, at the discretion of the ER, be doubled in value to a maximum value of N$10, 000.

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

9.4 Penalties

1. Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.
2. The 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;
    - 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;

3. Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

4. The following penalties are suggested for transgressions:

Impact	Penalty
Erosion	Penalty equivalent in value to the cost of rehabilitation plus 20%
Oil Spills	Penalty equivalent in value to the cost of clean- up operation plus 20%
Damage to indigenous vegetation	Penalty equivalent in value to the cost of restoration plus 20%.
Damage to sensitive environments	Penalty equivalent in value to the cost of restoration plus 20%.
Damage to cultural sites	Penalty to a maximum of N$100 000 shall be paid for any damage to any cultural/historical sites
Damage to trees	Penalty to a maximum of R10 000 shall paid for each tree removed without prior permission, or a maximum of R5 000 for damage to any tree, which is to be retained on site
Damage to natural fauna:	Penalty to a maximum of N$5 000 for damages to any natural occurring animal.

REPORT APPROVALS

The following Report set have been compiled and submitted for approval by the consultant to complete Milestone Deliverables 2 and 3 of the Client-Consultant services agreement under the Project, Katima Mulilo/Kongola Phase 3 Water Supply Schemes – Zambezi Region, Contract No. CS/S/NWSSP/004-2023.

- Katima Mulilo/Kongola Phase 3
  Water Supply Schemes ESMP Report and Management Plans

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MAWLR; PROJECT MANAGER/ENGINEER-NWSSP DATE:

This report set has been completed to the satisfaction of all in accordance with the requirements of the project and support the recommendations contained in this report.

_____ _____

MAWLR; PROGRAMME TECHNICAL ADVISOR -NWSSP DATE:

This report set has been discussed by interested parties within MAWLR and support the recommendations contained in this report.

_____ _____

AfDB; PROGRAM COORDINATOR - NWSSP DATE:

This report set is approved by MAWLR and signed as per delegated authority.

_____ _____

MAWLR; PROGRAMME DIRECTOR-NWSSP DATE: