

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

**Project Name:** Groundwater Mapping and Development Project in Kazungula District, Southern Province

**Country:** Zambia

**Subgrantee:** Ministry of Water Development and Sanitation, Zambia.

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### Project Description:

The project's objective is to conduct Groundwater Mapping and Development in the Sihumbwa area of Kazungula District.

- To identify and characterize aquifers in the Sihumbwa area with sufficient productive capacity.
- To determine the water demand for Sihumbwa school and the surrounding community.
- To construct and develop three (3) production boreholes.
- To design and construct a solar-powered water supply network for the school and the community.

The proposed project will have the following dimensions:

- Assessment and characterization of the Sihumbwa aquifers through geophysical investigations and exploration boreholes. The principal productive aquifers in the Sihumbwa area will be identified and characterized using standard groundwater techniques. The techniques will comprise desk studies, geophysical investigations, and exploration drilling.
- Drilling and equipping three production boreholes to supply water to Sihumbwa Basic School and the surrounding community. All three production boreholes will be drilled and equipped with solar-powered pumps to act as an alternative water source for the Sihumbwa area.

The activities directly related to the project will include:

- Community engagement and stakeholder sensitization.
- Reconnaissance surveys, hydrogeological assessments, geophysical surveys, and groundwater exploration.
- Drilling of test boreholes in selected areas.
- Construction of solar-powered production boreholes for Water Supply, Sanitation, irrigation, and animal watering structures.
- Procurement of goods and services.
- Project management and administration for goods and services; and
- Monitoring and evaluation.



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Environmental and Social Management Plan (ZAMBIA)				
Item	Mitigation, Management, and Enhancement Measures	Means of Verification	Responsibility Implement/Monitor	Monitoring Procedure
<b>A. General Requirements for ESHS Management</b>				
<b><u>Responsibilities and Liabilities</u></b>	Ensure that all workers, suppliers, and possible subcontractors are familiar with and comply with ESMP's ESHS requirements and specifications.	Induction training performed and recorded. Contracts with suppliers	Contractor/Ministry of Water Development and Sanitation /	Review of training records Review of Contracts to ensure that Project requirements are included
	<p>Notify the stakeholders, local construction and environment inspectorates, and communities of upcoming activities.</p> <p>Notify the public through appropriate notification in the media and/or at publicly accessible sites (including the works site).</p> <p>Acquire all legally required permits for construction.</p> <p>Carry out all work safely and discipline designed to minimize impacts on residents and the environment.</p> <p>Provide workers' personal protection equipment in compliance with international good practice (always hardhats, as needed masks and safety glasses, harnesses, and safety boots)</p>	<p>Notification issues</p> <p>Public notices issues</p> <p>Permits obtained</p> <p>Safety log maintained</p> <p>Visual inspection</p> <p>PPE purchase log</p>	Contractor / Ministry of Water Development and Sanitation	Review prior to finalization of Project-specific ESMP.



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	Provide appropriate signposting of the sites informing workers of key rules and regulations to follow.			
<b><u>Resources allocated to ESHS Management</u></b>	The Ministry of Water Development and Sanitation has assigned an Environmental and Social expert to this project. The E&S expert will be committed to the requirements of this ESMP and will also be responsible for contacting stakeholders.	Compliance with the mitigation measures outlined in this ESMP  Inform the relevant authorities about the ESHS that is responsible.	Contractor/ Ministry of Water Development and Sanitation	Review prior to finalization of Project-specific ESMP
<b><u>Reporting</u></b>	Reporting of progress and incidents, accidents, observations, and near misses. This will also be included in the ESS monthly reports.	Compliance with the mitigation measures outlined in this ESMP  Reporting protocol for ESHS incidents	Contractor/ Ministry of Water Development and Sanitation	Review once prior to finalization of Project-specific ESMP
Code of Conduct	Follow the SADC-GMI-established Code of Conduct, considering legislation, safety rules, substance abuse, environmental sensitivity, communicable diseases, gender issues (sexual harassment), respect for local beliefs and customs, community interactions, etc.	Code of Conduct in place and rules shared with personnel	Contractor/ Ministry of Water Development and Sanitation	Review of Code of Conduct induction records  Review of reported punishable or misconduct behaviour  Review of grievance records
<b><u>ESHS Training</u></b>	Provide H&S induction and training and raise awareness among the workforce regarding H&S risks and mitigation measures (including indirect workers) tailored to the Project scope.	Training performed and recorded	Contractor/ Ministry of Water Development and Sanitation	Review of training records

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<b>B. Protection of the Environment</b>				
Protection of adjacent areas	Restrict excavation activities during periods of intense rainfall. Use temporary bunding to reduce the risk of sediment, oil, or chemical spills into the receiving waters.	Site inspections Supervisory checklist Unsuccessful boreholes backfilled Excavation on hold during intense rainfall	Contractor/ Ministry of Water Development and Sanitation, WARMA, ZEMA	Check weather forecast Inspect the site conditions prior and during excavation.
	Ensure that means of protection are in place to avoid or minimize adverse effects on vegetation, soils, groundwater and surface water, biodiversity, natural drainage, and the water quality in areas within the works area. Construction methods to minimize impacts to the extent possible.	No impacts were identified in the adjacent environment The Contractor developed a supervisory checklist that was approved by the Ministry of Water.	Contractor/ Ministry of Water Development and Sanitation, ZEMA	Regular supervision (including monitoring of adjacent natural resources).
	Ensure that work site boundaries and limits are in accordance with plans agreed upon in advance. All construction activities should be carried out within boundaries.	Marking the borders of the works site using danger tape Inform the immediate community of the borders of the work site	Contractor/ Ministry of Water Development and Sanitation	Site inspection prior to commencement of activities and Regular supervision
	Be sure to stay out of the surrounding wetland areas.	Site inspections The Contractor developed a supervisory checklist that was approved by the Ministry of Water. Pre-construction survey	Contractor/ Ministry of Water Development and Sanitation, Forest Department	Site inspection prior to commencement of activities; and Regular supervision



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<b>B. Protection of the Environment</b>				
	Ensure to keep the minimum distances from permanent water course and outside of floodable areas; sensitive urban services and buildings (health centre, school, water supply for populations); any housing;	Marking the borders of works site boundaries in line with given limits and usage of warning signs	Contractor/ Ministry of Water Development and Sanitation,	Site inspection prior to commencement of works; and Regular supervision
	After construction, form reshaped land so that it is inherently stable, adequately drained, suitable for the desired long-term land use, and allows the natural regeneration of vegetation.	Visual inspection and comparison with adjacent undisturbed areas.	Contractor/ Ministry of Water Development and Sanitation,	Site inspection before and after completion of works
Pollution prevention	Ensure all works carried out minimize pollution risk (e.g., liquid effluents, air emissions, noise and vibration management, vehicle and equipment maintenance and selection, fuel, oil, and chemical storage and handling) throughout the project's duration.	Ensure that potential pollutants are not stored and handled within 50 m of sensitive receptors (particularly watercourses).  Ensure that potential pollutants are safely stored, i.e., stored above the catch pan.	Contractor/ Ministry of Water Development and Sanitation,	Site inspection prior and during the commencement of works
Effluents	Ensure appropriate containment and storage of construction wastewater, including sanitary water.  Ensure that no untreated effluent is discharged.	No untreated wastewater discharge	Contractor / Ministry of Water Development and Sanitation,	Regular site inspection  Review of grievance records

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<b>B. Protection of the Environment</b>				
Emissions and dust	Ensure that the contractor staff is wearing appropriate PPE, e.g., face mask. Sensitize communities to maintain a safe distance.	Daily visual inspection of the site The Contractor developed a supervisory checklist that was approved by the Ministry of Water.	Contractor / Ministry of Water Development and Sanitation	Visual inspection during regular supervisory visits
	Sensitize drivers to turn off the vehicles when not in use.	Vehicle engines are switched off when not in use	Contractor / Ministry of Water Development and Sanitation	Site inspection and review of grievance records
Noise and vibration	Avoid operations like drilling and vehicle movements at night.	No work was conducted between 8 pm and 6 am	Ministry of Water Development and Sanitation	Site Inspection and review of grievance records
	Locate stationary equipment (such as power generators) as far as possible from nearby receptors (e.g., worker resting areas, populated areas, and environmentally sensitive areas). Ensure that noise levels don't exceed 120db in case of equipment or vehicle use.	Adequate distances between equipment and receptors are kept Use of sound detector to ensure that noise level is kept below the recommended level	Contractor/ Ministry of Water Development and Sanitation	Once prior to the commencement of works Monitor noise levels in case equipment is used Review of grievance records
Vegetation clearing	Limit vegetation clearing to areas within the site boundary where it is strictly necessary.	Vegetation clearing minimal Marking the borders of works site boundaries	Contractor/ Ministry of Water Development and Sanitation	Site inspection prior to commencement of activities.

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<b>B. Protection of the Environment</b>				
	Describe the methods of vegetation clearance. Ensure that no chemicals/pesticides are used, burning vegetation is restricted, etc. Do not clear vegetation more than two months before operations.	No use of fires or chemicals on site Marking the borders of works site boundaries Usage of warning signs	Contractor/ Ministry of Water Development and Sanitation	Site inspection prior to commencement of activities. Site inspection during site clearance
	Avoid clearing mature trees and endangered species.	No mature trees were cleared	Contractor/ Ministry of Water Development and Sanitation	Site inspection prior to commencement of activities.
	Avoid, to the extent possible, areas of ecological value.	Areas of ecological value avoided	Contractor/ Ministry of Water Development and Sanitation	Site assessment prior to site selection. Ecological value assessment if needed.
	Avoid natural habitat disturbance.	No habitats disturbed	Contractor/ Ministry of Water Development and Sanitation	Inspection of drilling practices.
	Ensure that rehabilitated areas don't pose health and safety risks (such as holes and ponds).	Reinstatement completed	Contractor/ Ministry of Water Development and Sanitation	Inspection after drilling Inspection after heavy rainfalls and snow



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<b>B. Protection of the Environment</b>				
	<p>Limit vegetation clearing to areas within the site boundary where it is strictly necessary.</p>	<p>Visual Inspection of vegetation clearing will be conducted.</p> <p>Before vegetation clearing, approval will be sought to ensure that vegetation clearing is kept to necessary areas only</p>	<p>Contractor/ Ministry of Water Development and Sanitation</p>	<p>Site inspection prior to commencement of activities.</p> <p>Review of grievance records</p>
	<p>Avoid clearing mature trees and endangered species.</p> <p>In areas where endangered species are known to exist, carry out adequate evaluation to ensure that the works will not adversely impact them. Plan adequate mitigation measures to ensure the works will not negatively affect the endangered species.</p> <p>If endangered species are found unexpectedly during works, halt all works, provide an ad hoc assessment of the areas for endangered species, and establish adequate mitigation measures.</p>	<p>Visual Inspection and comparison of matured trees before and after works</p>	<p>Contract/ Ministry of Water Development and Sanitation, Forest Department</p>	<p>Site inspection prior to commencement of activities.</p> <p>Review of grievance records</p>



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<b>B. Protection of the Environment</b>				
		The contractor has adopted and implemented effective waste management procedures.	Contractor/ Ministry of Water Development and Sanitation	Inspect waste management or disposal sites or protocols during

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<b>C. Health and Safety</b>				
<b>Accident reporting</b>	Ensure the Environmental and Social Specialist records and properly follow up on all H&S-related incidents (e.g., observations, accidents) and GBV issues on site.	H&S incident reporting protocol in place	Contractor/ Ministry of Water Development and Sanitation	Check incident/accident records
<b>Personal protective equipment</b>	Ensure the provision of Personal Protective Equipment (PPE) (i.e., hard hats, masks, safety glasses, safety boots) for workers.  Mandate the contractor to provide adequate PPE to workers at all times. Include the mandate in the contract agreement with the selected contractor.  The Contractor shall provide appropriate safety equipment to all his staff on site and comply with local legislation with regard to Health & Safety requirements.	Daily visual inspection  Supervisory checklist developed by the Contractor and approved by the Ministry of Water Development and Sanitation.	Contractor/ Ministry of Water Development and Sanitation	Regular supervisory visits to check PPE



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<b>C. Health and Safety</b>				
<b>First-aid</b>	<p>The Contractor shall provide and maintain all equipment necessary to render first aid in case of accidents or other emergencies in operative conditions. This equipment shall be kept in readiness at the works' sites, at camps, and wherever the Contractor's staff may regularly live and work.</p> <p>The Contractor shall ensure that persons with knowledge of simple first-aid procedures and the ability to administer help in the event of injury are available at all such places.</p> <p>The Contractor shall be responsible for the cost of all site welfare arrangements, health requirements, warning signs, and all other safety precautions.</p> <p>All work is to be executed in a safe and responsible manner, and the Contractor is to proceed by the provisions of the appropriate legislation.</p>	<p>Visual inspection</p> <p>First aid is on site and adequately stocked</p> <p>The Contractor developed a supervisory checklist approved by the Ministry of Water Development and Sanitation.</p>	Contractor/ Ministry of Water Development and Sanitation	Regular supervisory visits to check the availability of first aid kit
<b>Hygiene, accommodation and food</b>	Ensure the provision of Health and Safety (H&S) and hygienic and sanitary facilities at the site (toilets, drinking water, shade).	Daily visual inspection	Contractor/ Ministry of Water Development and Sanitation,	Monthly supervisory visits to check the hygiene



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<b>D. Labour and relations with local communities</b>				
<b><u>Labour conditions</u></b>	Ensure minimum legal labour standards as per UNAM guidelines and WB ESS2 regulations (child/forced labour, sexual assault, no discrimination, equal opportunities, working hours, minimum wages) are met.	Grievance Mechanism Records, Training performed and recorded	Contractor/ Ministry of Water Development and Sanitation	Review of Inspection reports (also from labour authorities), Review of grievance records Review of training records
	Ensure that all direct and indirect workers have access to and are aware of the Grievance Mechanism, where they can raise workplace-relevant complaints anonymously.  (See Sub grants manual – Grievance Mechanism procedure)	Grievance Mechanism in place and grievances recorded Training performed and recorded	Contractor/ Ministry of Water Development and Sanitation	Review of grievance register Review of training records
	Ensure all workers have the same rights and are treated equally.	Non-discrimination policy in place	Contractor/ Ministry of Water Development and Sanitation	Random site inspection Review of grievance register
Local recruitment	Where appropriate, ensure local communities are preferred for supplying goods and services to the Project and Project personnel.	Local Procurement and Employment Records	Contractor/ Ministry of Water Development and Sanitation	Review procurement and employment rules and records Review of grievance register
Transport	Organise carpools/buses for worker transportation where needed.	Carpools/ buses used	Contractor/ Ministry of	Review of registered transport policy

			Water Development and Sanitation	
<b><u>Community interaction</u></b>	Engage/ communicate/inform communities. Ensure consultations with the local authorities and communities regarding the drilling. Obtain local knowledge regarding chance finds and land acquisition matters.  Maintain a grievance record on site.  Maintain a grievance box on site.	Minutes of Meetings  The Grievance Mechanism would be handled through the Ministry of Water Development and Sanitation resources policies and the SADC GMI procedures. All grievances will be reported accordingly, in accordance with World Bank Procedures.  Grievance record on site  Submit complaints anonymously using the grievance box	Contractor/ Ministry of Water Development and Sanitation	Review of grievance register  Minutes of consultation meetings
	Initiate an efficient Grievance Mechanism to allow potentially affected individuals to raise their concerns.  Inform the communities on the method of submitting grievances: email <a href="mailto:safeguard@sadc-gmi.org">safeguard@sadc-gmi.org</a>	SADC-GMI Sub-Grant Manual  Grievances received through email <a href="mailto:safeguard@sadc-gmi.org">safeguard@sadc-gmi.org</a>	Contractor/ Ministry of Water Development and Sanitation	Review of grievance register
	Engage with the local community and potentially affected households to understand their needs and identify the risk of damage to their livelihoods through the Project (e.g., taking pastureland, lack of access to water).	Minutes of Meetings  Grievance Mechanism records	Contractor/ Ministry of Water Development and Sanitation	Review of grievance register and meeting minutes



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Damage to people and property	Ensure all contractors implement codes of conduct concerning employment and workforce behavior (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general).	Code of Conduct (See Sub grants manual code of conduct) Grievance Mechanism records	Contractor/ Ministry of Water Development and Sanitation	Worker interviews, Review of grievance log
	Ensure site areas have appropriate security, fencing, signage, and lighting. Use hazard notices/signs/barriers to protect children and other vulnerable people from harm and prevent access to non-workers.	H&S planning of drilling site done, items installed	Contractor/ Ministry of Water Development and Sanitation	Inspection prior to the activities. Random site inspection Review of grievance register
Traffic management	Ensure safe driving by Project personnel (e.g., through training/induction).	Driver Training Records as part of Induction training	Contractor/ Ministry of Water Development and Sanitation	Review of training records
	Target signage and outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas.	Warning signs Minutes of Meetings	Contractor/ Ministry of Water Development and Sanitation	Inspection of traffic routes, Review of grievance register
Land acquisition and land take	The proposed boreholes and associated infrastructure will be installed and operated on government land. The monitoring equipment is localized at the borehole	Land acquisition will be avoided by installing the works on government land.	Contractor/ Ministry of Water Development	Inspection during site selection Review of grievance log



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	<p>sites, and associated water distribution infrastructure will be confined to servitudes on government land. There will be no need to acquire private/community household land, so the acquisition of land for this project is not foreseen.</p> <p>For the government-owned land, the Ministry of Water will use its influence to liaise with the relevant government ministry to access the land using the government standard procedures/protocols.</p> <p>In the very unlikely event that land has to be acquired for works on non-government-owned land, the Ministry of Water will engage the land owner with the support of the community leader to inform them of the intended land use as part of securing a formal written agreement that the land will be voluntarily donated to the project and that such a donation does not impact the land owner's livelihood.</p> <p>In the event that the landowner or community leader does not consent to volunteering the land, The Ministry will cease further negotiations on the matter. Avoid, to the extent possible, the land take of both formal and informal landowners/land users. If land take is inevitable, no forced eviction should take place. Where consent has been secured, the landowner will sign a confirmation document to that effect, and copies of this document will remain with the landowner, local government, and Prime Partner.</p>	<p>However, under unlikely extenuating circumstances where land has to be acquired, a signed document, showing voluntary donation of the land to the project, in place</p>	<p>and Sanitation, Contractor</p>	
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	<p>Regardless of the necessity for land acquisition, the Ministry will facilitate stakeholder engagement at the start of the project and quarterly thereafter to solicit community participation.</p>			
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