



ZIMBABWE

MINISTRY OF LANDS, AGRICULTURE, FISHERIES, WATER AND RURAL

DEVELOPMENT

DEPARTMENT OF WATER RESOURCES DEVELOPMENT AND UTILISATION

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE SIYAKOBVU WATER PROJECT

Project Location: **Negande (Ward 5 and 6), Omay Communal Lands, Kariba District, Zimbabwe**

Scope: **Installation of Community Reverse Osmosis (RO) Plant for Fluoride Removal and Rehabilitation of Negande Gravity-Fed Piped Water Scheme.**

Contractor Details: **Contractor not yet in place**

PROJECT OVERVIEW

The Siyakobvu Water Project aims to rehabilitate the existing Mapangwa-Negande gravity-fed piped water scheme whose source is the Negande spring and install a community Reverse Osmosis (RO) treatment plant to address critically high fluoride levels in the water supply. The project will serve approximately 18 villages across Ward 5 and 6, benefiting 4 schools (Malembeja, Negande Secondary, Negande Primary, and Nselelo), 1 clinic (Negande Clinic), and the broader community under Chief Negande's traditional authority.

The project involves rehabilitating a 5km segment of the total 20km pipeline, specifically the section directly feeding the treatment plant. To ensure environmental compliance and safety, on-site contractors will execute the work under the direct guidance and procedural oversight of the Department of National Parks. Any engagement of community labor by the contractor during rehabilitation process will be conducted in full compliance with the guidelines and regulatory frameworks outlined in the project's TOR and contractual agreements. Water quality testing has revealed fluoride concentrations of 10-10.5 mg/L, which is 7 times higher than the WHO maximum allowable limit of 1.5 mg/L, posing severe health risks, including dental and skeletal fluorosis. The existing infrastructure, constructed in 1993, suffers from aging pipelines, decommissioned storage tanks, illegal connections, elephant damage in the game park section, and the absence of formal governance through a Water User Committee.

The project scope includes:

- Installation of a solar-powered community RO plant for fluoride removal
- Rehabilitation of the pipeline network
- Establishment of a Water User Committee for sustainable management
- Community health awareness and capacity building programs.

This ESMP outlines the environmental and social management measures to be implemented throughout the project lifecycle to mitigate potential negative impacts and enhance positive outcomes.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN MATRIX

Item	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
A. General Requirements for ESHS Management				
Responsibilities and Liabilities	Ensure all workers, suppliers, and subcontractors are familiar with and comply with Environmental, Social, Health and Safety (ESHS) requirements. Include ESMP requirements in all contracts. Conduct mandatory induction training for all personnel.	Induction training records; Contracts with ESMP clauses; Signed acknowledgment forms	DWRDU, RIDA/DWSSC, Hydrogeospatial Consultancy PL, Contractor	Review training records monthly; Verify contract compliance quarterly
Resources allocated to ESHS Management	Assign dedicated ESHS officer for project duration. Allocate budget for ESHS activities including monitoring, training, and mitigation measures. Ensure ESHS officer has authority to stop unsafe work.	ESHS officer appointment letter; ESHS budget allocation; Monthly ESHS reports	DWRDU, Hydrogeospatial Consultancy PL	Review ESHS officer performance monthly; Track ESHS budget expenditure
Reporting	Establish incident reporting protocol. Report all accidents, near misses, and grievances within 24 hours. Submit monthly ESHS reports to SADC-GMI. Conduct quarterly ESHS performance reviews.	Incident reports; Monthly ESHS reports; Quarterly review minutes	ESHS Officer, DWRDU	Review incident reports weekly; Verify monthly reporting compliance
Code of Conduct	Adopt and implement a Code of Conduct in line with WB ESF, SADC GMI Sub-grantee Manual, national legislation and safety rules covering issues of but not limited to substance abuse, environmental sensitivity, communicable diseases, gender issues, sexual harassment, respect for local beliefs and customs, community interactions etc. Enforce disciplinary measures for violations.	Signed Code of Conduct; Disciplinary records; Awareness posters	Contractor, ESHS Officer	Verify 100% signing; Review disciplinary cases monthly
ESHS Training	Provide ESHS induction for all workers covering: safety rules, environmental protection, community relations, GBV prevention, grievance mechanism etc.	Training attendance sheets; Training materials; Toolbox talk records	ESHS Officer, Contractor	Review training records monthly; Assess worker knowledge through spot checks

	Conduct refresher training quarterly. Toolbox talks weekly.			
B. Protection of the Environment				
Water Quality Monitoring	<p>Conduct monthly water quality testing at spring source, RO inlet, RO outlet, and distribution points. Test for fluoride, manganese, sulphates, pH, TDS, EC per SAZS 560:1997. Maintain testing records. Take corrective action if standards exceeded.</p> <p>The District Water Supply and Sanitation Committee (DWSSC) will oversee water quality monitoring, including the collection and transport of samples to accredited government laboratories.</p> <p>Water quality monitoring will involve a combination of on-site field testing and off-site laboratory analysis, conducted in strict accordance with DWSSC</p> <p>The project budget also includes funds for sampling containers and insulated transport coolers, as well as post water quality analysis</p>	Laboratory test reports; Water quality database; Corrective action records	DWRDU, DWSSC, Water User Committee	Review test results monthly; Annual external audit of water quality
Brine Management from RO Plant	<p>Construct lined evaporation ponds (HDPE geomembrane) for brine disposal. Size ponds for 30-40% reject rate. Monitor pond integrity monthly. Test groundwater downgradient quarterly for contamination. Explore beneficial reuse options (e.g., salt extraction).</p> <p>To mitigate drowning risks, a secure perimeter fence will be installed around the 2m x 2m x 1.5m impervious evaporation pond</p>	Evaporation pond construction records; Liner integrity reports; Groundwater monitoring data	Contractor, DWRDU, RIDA/DWSSC	Monthly pond inspections; Quarterly groundwater testing; Annual Pond capacity review
Spring Protection	Conduct monthly cleaning and maintenance. Restrict activities within 50m of spring. Monitor spring yield monthly The spring provides a sustainable	Spring box photos; Maintenance logs; Yield monitoring data	Water User Committee	Monthly spring inspections; Quarterly yield assessment

	dry-season yield of 3.4L/s. Existing storage tanks near the spring manage initial collection and conveyance. Treatment units and secondary storage tanks will be strategically installed at water points. This separation is designed to minimize physical interference with the spring and mitigate the risk of source-point contamination..			
Pipeline Protection from wild animals (Elephants)	Bury exposed pipeline sections in game park to minimum 0.7m depth. Coordinate with wildlife authorities. Conduct regular patrols. Repair damage within 48 hours. Consider wildlife water points to reduce pipeline interference. In accordance with the project's design and feasibility study, a minimum ecological reserve of 0.5L/s must be maintained from the spring's output. This mandated environmental flow is essential to sustain the downstream wetland ecosystem and serves as a critical mitigation strategy to reduce human-wildlife conflict by ensuring water availability for local fauna	Pipeline burial records; photos; Patrol logs; Damage repair records	Contractor, DWSSC, Wildlife Authority/NRDC	Weekly patrols during construction; Monthly inspections during operation
Pollution Prevention	Store fuels, oils, chemicals >50m from watercourses in bunded areas. Provide spill kits at storage areas. Train personnel on spill response. Dispose of waste oils through licensed contractors. Maintain equipment to prevent leaks. The Terms of Reference (TOR) for this activity mandate the use of secured facilities that maintain full compliance with established environmental and pollution control regulations	Storage area inspection; Spill kit inventory; Training records; Waste disposal certificates	Contractor, ESHS Officer	Weekly storage area inspections; Review waste disposal records monthly
Construction Waste Management	Segregate waste at source (metal, plastic, concrete, organic). Reuse/recycle where feasible. Proper disposal of non-	Waste segregation bins; Recycling records; Disposal	Contractor	Daily site inspections; Monthly waste disposal record review

	recyclable waste Remove old pipes and decommissioned tanks properly. Keep site clean.	certificates; Site inspection photos		
RO Membrane Disposal	Spent RO membranes to be disposed of as hazardous waste through licensed contractor. Maintain disposal records. Explore membrane recycling options with suppliers. Prior to procurement, a market and technical assessment will be conducted to identify high-performance systems featuring regenerable membranes. To ensure long-term sustainability, this will be paired with capacity-building programs for technicians, focusing on Operation and Maintenance (O&M)	Hazardous waste disposal certificates; Disposal records	Water User Committee, DWRDU	Review disposal records annually
Dust and Emissions Control	Water unpaved roads and work areas twice daily during dry season. Cover material stockpiles. Limit vehicle speeds to 30km/h. Maintain vehicles to minimize emissions. Provide dust masks to workers.	Water truck logs; PPE distribution records; Vehicle maintenance records	Contractor	Daily visual inspections; Review community grievances
Noise and Vibration	Restrict noisy activities to 6am-8pm. Locate generators >100m from homes/schools. Notify community 48 hours before noisy works. Maintain equipment to reduce noise. Provide ear protection to workers. To mitigate noise disturbance, it is recommended that the consultant provide power generation units fitted with residential-grade silencers. This measure is particularly important to prevent disruption to the surrounding community and local wildlife near the spring site	Work schedule; Community notification records; Equipment maintenance logs; PPE records	Contractor	Daily work schedule review; Noise level measurements if complaints received
Vegetation Clearing	Limit clearing to minimum necessary within site boundaries. Mark trees to be retained. Avoid clearing mature trees and endangered species. Replant disturbed	Vegetation clearing plan; Tree marking; Replanting records; Photos	Contractor, ESHS Officer	Pre-construction and post-construction vegetation surveys

	areas with native species after construction.			
Soil Erosion Control	Install erosion control measures (silt fences, sandbags) before excavation. Minimize duration of exposed soil. Compact and revegetate disturbed areas. Construct drainage channels to prevent erosion.	Erosion control installation photos; Site inspection reports	Contractor	Weekly site inspections during rainy season; Monthly during dry season
C. Health and Safety				
Community Health Awareness	Conduct community awareness campaign on fluoride health risks (dental and skeletal fluorosis). Explain RO treatment benefits. Provide safe water use training. Distribute educational materials. Screen community for fluorosis and refer cases.	Community meeting attendance; Educational materials; Health screening records	DWRDU, Ministry of Health, Hydrogeospatial	Track awareness campaign reach; Monitor fluorosis prevalence
Personal Protective Equipment	Provide appropriate PPE to all workers: hard hats, safety boots, gloves, goggles, dust masks, ear plugs. Train on proper use of PPE. Enforce PPE use - no PPE, no work. Replace damaged PPE immediately.	PPE distribution records; Training records; Site inspection photos; PPE replacement logs	Contractor	Daily PPE compliance checks; Monthly PPE condition assessment
First Aid	Maintain fully stocked first aid kits at all work sites. Train at least 2 workers per site in first aid. Display emergency contact numbers. Arrange transport for medical emergencies. Report all injuries within 24 hours.	First aid kit inventory; First aid training certificates; Emergency contact list; Injury reports	Contractor	Weekly first aid kit checks; Review injury reports monthly
Hygiene and Sanitation	Provide clean drinking water at all sites. Install portable toilets (1 per 20 workers). Provide handwashing facilities with soap. Ensure daily cleaning of facilities. Provide shaded rest areas.	Toilet and handwashing facility inspection; Cleaning logs; Worker feedback	Contractor	Daily facility inspections; Weekly worker satisfaction surveys
COVID-19 and Communicable Diseases	Implement COVID-19 prevention measures as per national guidelines. Provide masks and sanitizers. Screen workers daily. Isolate suspected cases. Promote vaccination. Prevent malaria through mosquito control.	Health screening records; Mask/sanitizer distribution; Isolation facility	Contractor, ESHS Officer	Daily health screening; Track disease cases

Traffic Safety	Install warning signs at work zones. Provide traffic control personnel. Limit vehicle speeds. Maintain safe distances from schools during drop-off/pick-up. Ensure drivers are licensed and trained.	Warning signs; Traffic control records; Driver licenses; Training records	Contractor	Daily traffic control checks; Review accident reports
D. Labour and Relations with Local Communities				
Local Recruitment	Prioritize local hiring for unskilled and semi-skilled positions (target 70%). Advertise jobs through Chief Negande and village heads. Provide equal opportunity regardless of gender/ethnicity. Maintain transparent recruitment process.	Job advertisements; Employment records showing local vs. non-local; Recruitment process documentation	Contractor, Water Point Committee	Monthly review of employment records; Track local employment percentage
Fair Working Conditions	Comply with Zimbabwe Labour Act. Provide written contracts. Pay fair wages (at least minimum wage). Limit working hours to 8 hours/day. Provide weekly rest days. Ensure freedom of association.	Employment contracts; Payroll records; Working hour logs; Worker feedback	Contractor	Monthly payroll audits; Quarterly worker interviews
Water User Committee Establishment	Facilitate formation of WUC with representation from all villages, schools, clinic. Ensure gender balance (at least 40% women). Register WUC legally. Provide training on O&M, financial management, governance. Support WUC to develop bylaws and tariff structure.	WUC formation minutes; Registration certificate; Training records; WUC bylaws	DWRDU, DWSSC, Chief Negande	Quarterly WUC performance assessment; Annual governance audit
Stakeholder Engagement	Conduct monthly community meetings during construction. Provide project updates through noticeboards, radio, village meetings. Consult on key decisions. Hold separate sessions for women, youth, vulnerable groups. Document all consultations.	Meeting attendance sheets; Meeting minutes; Consultation photos; Feedback summary	ESHS Officer, Hydrogeospatial	Review consultation records monthly; Track stakeholder satisfaction
Grievance Redress Mechanism	Establish accessible GRM with multiple channels: suggestion boxes, hotline, community representatives, written submissions. Acknowledge grievances within 3 days. Resolve within 30 days. Maintain grievance log. Report monthly.	GRM procedures; Grievance log; Resolution records; Monthly GRM reports	ESHS Officer, WUC	Review grievance log weekly; Track resolution rate and timeliness If the community-level WUC fails to resolve the issue, the grievance should be formally escalated to the District

				Water Supply and Sanitation Committee (DWSSC)
GBV/SEA Prevention	Implement GBV/SEA prevention measures: Code of Conduct, awareness training, safe reporting channels, survivor support services. Prohibit fraternization between workers and community members. Enforce zero tolerance policy.	GBV training records; Code of Conduct; GBV incident reports; Disciplinary records	Contractor, ESHS Officer	Monthly GBV awareness sessions; Track and investigate all reports
Vulnerable Groups Protection	Identify vulnerable households (female-headed, elderly, disabled, poor). Ensure their access to water through subsidized tariffs or free public standpipes. Include them in consultations. Provide assistance during disruptions.	Vulnerable household register; Subsidy records; Consultation attendance; Assistance logs	WUC, Chief Negande	Quarterly vulnerable group assessments; Track subsidy uptake
Cultural Heritage	Conduct chance find procedure training. Stop work if cultural artifacts found. Notify authorities. Respect sacred sites and traditional practices. Consult traditional leaders on culturally sensitive matters.	Chance find procedure; Training records; Consultation records	Contractor, ESHS Officer, Chief Negande	Include in weekly toolbox talks; Document any chance finds
Capacity Building	Train WUC members on RO operation and maintenance including on the job training during construction and installations. Train operators on water quality testing. Provide financial management training. Conduct community awareness on water conservation. Build skills for sustainable management.	Training curricula; Training attendance; Skills assessment; Training materials	DWRDU, Chinhoyi University, DWSSC	Assess trainee competency; Track system performance post-training