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PROJECT: Bulawayo Water and Sewerage Services Improvement Project

COUNTRY: Zimbabwe

ENVIRONMENTAL AND SOCIAL MANAGEMENT SUMMARY

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) SUMMARY

Project Title:	Bulawayo Water and Sewerage Services Improvement Project
Project Number:	P-ZW-E00-006
Country:	Zimbabwe
Department:	ZWFO/OWAS
Division:	OWAS.2
Project Category:	Category 2

1. Introduction

The City of Bulawayo (CoB) intends to improve and upgrade the water supply and sewerages services in the city with the aim of contributing to the improvement in health and social wellbeing of its population. The proposed project's emphasis is on rehabilitating and enhancing the water supply system, strengthening institutional capacity, enhancing service delivery efficiency and contributing to environmental improvement through rehabilitation of sanitation infrastructure. The CoB, with support from the African Development Bank, aims to reduce the city's Non-Revenue Water (NRW), upgrade and rehabilitate the water distribution system, improve the sewer drainage capacity, rehabilitate waste water treatment facilities as well as strengthen community participation and buy-in.

Bulawayo is the second largest city in Zimbabwe. According to the 2012 census statistics report, it has an estimated population of about 655,675. The City has a total of 129,123 properties and 121,732 number of metered connections. It is faced with frequent severe water shortages due to its location in a drought prone region. The city's average annual rainfall is 590mm, and is close to the Kalahari Desert making it vulnerable to droughts and rainfall tends to vary sharply from one year to another .The suppressed daily consumption is on average 120Ml/day. In terms of the Water and Waste Water Master Plan the demand is estimated at 156Ml/day. NRW is estimated at 69% with the high losses attributed primarily to old infrastructure and inadequate resources to construct, manage, operate and maintain water systems. In the short term the City will need to augment its supplies which require huge capital investments to meet water supply constraints. The City has therefore adopted strategies such as Water Conservation and Water Demand Management (WCWDM) to preserve water resources. In terms of sewerage services, the city is plagued with collapsed sewers due to aging infrastructure, thereby limiting sewer drainage capacity, and is in need of rehabilitating the city's waste water treatment facilities. Currently, of the 80Ml/day expected to be treated; only 30% is finding its way into treatment facilities with 70% being discharged directly in to streams and rivers.

It is against this backdrop and with the aim of contributing to the improvement of health and social wellbeing of the city's population that the Bulawayo Water and Sewerage Service Improvement Project has been developed. The project is to be implemented over a forty-eight month period from 2016 to the end of 2019, with a total project cost of USD 36 million. To maximize the benefits to be accrued as a result of the proposed project in terms of provision of more reliable and safe supply of water and sanitation services, an Environmental and Social Management Plan (ESMP) has been prepared to identify the environmental and social

management and mitigation actions required to address any potential adverse impacts and to implement the project in accordance with the requirements of the African Development Bank (AfDB) and applicable national legislation and regulations of Republic of Zimbabwe. The ESMP provides an overview of the environmental and social baseline conditions on the direct impacted areas, summarizes the potential impacts associated with the proposed project and sets out the management measures required to mitigate any potential impacts. The ESMP is to be utilized by the Consultants/Contractors to be commissioned by CoB for the project and will form the basis of site-specific management plans that will be prepared by the contractors and sub-contractors as part of their construction methodology prior to works commencing.

2. Brief project description and key components

The objective of this project is to improve water supply and sewerage services in Bulawayo. It entails the rehabilitation and upgrading of water production treatment facilities, water distribution, sewer drainage networks and upgrading and rehabilitation of wastewater treatment and disposal facilities. All these activities will result in improved supply of safe drinking water for the general population as well as reduce environmental nuisance through reduced sewer spillages and proper treatment before discharging to water bodies downstream.

The Bulawayo Water and Sewerage Services Improvement Project involves the components summarized in the following table:

Component	Description
Water Systems Efficiency Improvement	• Enhance Pump station • Refurbish water treatment plants • Renewal of Water Mains (133km) • Upgrade of water mains (8.5km) • Reduction of Non-Revenue Water • Distribution reservoir meter and monitoring telemetry and solar booster pump station at *Magwegwe* Reservoir • System water meter replacement (17,714 domestic water meters) • Provide operation and maintenance equipment
Environmental Improvement	• Conduct baseline surveys and production of business reports for renewal of the Sewer infrastructure • Rehabilitation of outfall sewers (SAST Catchment – 3.9km; Cowdray Park Catchment – 14.5km) • Rehabilitation of Southern Area Waste Water Treatment Plant (SAST WWTW Plants 1 & 2)
Institutional Capacity Building	• Provide technical assistance for NRW program development • Strengthen customer billing systems • Operational and Institutional CB • Training of operation and maintenance staff • Institutional outreach support. • Undertake participatory hygiene promotion intervention in the most vulnerable communities • Develop appropriate communication tools to create awareness for behavior change among the population of the Project towns on pertinent WASH issues such as the appropriate use of water and sanitation facilities,

	conservation of water, financial sustainability, and public accountability to water and sanitation issues • Integrate community based water quality monitoring and some element of epidemic or disease outbreak and water quality monitoring
Project Management & Engineering Services	• Provide project management, Engineering design and supervision services • Provide procurement services • Monitor and evaluate project delivery • Project management • Undertake annual auditing services.

3. Major environmental and social impacts and climate change risk

Significant and long-term impacts of the project are mainly positive and include: improved access to safe and reliable water supply; water resource conservation as a result of reduction in system leakages; and reduction in contamination of water bodies through improved pumping and treatment of wastewater to required standards.

The project involves rehabilitation of existing equipment, which for all intents and purposes is equivalent to day to day maintenance. However, it has localized and temporary negative impacts which are expected to include: soil and groundwater contamination from the waste water flows or leaks during the rehabilitation of treatment facilities and replacement of pipes; disruption of water and sewage services to users during the rehabilitation which would result in among others disturbing schedules or taking time away from informal trading which seems to be a living for the majority of the population in the involved areas; water quality deterioration during the rehabilitation of infrastructure and lack of poor quality detection due to on-going work in the laboratories where relevant; occupation health hazards to employees during the work; emergency preparedness such as flooding of pump stations and other related emergencies where the manual checks are disrupted by focus on the new work or wastewater pipeline ruptures; environmental pollution from the increased wastewater sludge generation from the de-sludging activities and all other forms of waste generated as part of the rehabilitation process; reduced storage capacity of freshwater; increased erosion of the excavated topsoil and growth of alien plant vegetation on such areas; and health problems and nuisance from waste water flows or leaks including possible dust, odor and noise emissions from the excavations and transportation of waste and other materials. These impacts, however, are site specific and can be mitigated through the implementation of a set of measures outlined below.

In terms of climate change, the project provides the CoB with adaptation tools which help it address climate change risk. These measures include conservation of water sources, especially water springs, ground water recharge points and river catchments; reduction of non-revenue water; enhance effluent quality control at wastewater treatment facilities to protect receiving water bodies and environment from pollution; and introduction of educational programs on economical water uses at household levels. In terms of mitigation, project activities includes installation of solar photovoltaic water pumps at the *Magwegwe* reservoir in lieu of relying on diesel powered generators and the development of plans for water re-use and energy generation from waste.

4. Enhancement/mitigation measures and complementary initiatives

Impacts expected from the project are mainly positive as the project aims to improve access to safe water supply, promote natural resource conservation through the reduction of leaks, and reduce pollution in rivers and other freshwater bodies by discharging wastewater of acceptable quality. Where negative impacts arise, mitigation will include:

Activity	Impact	Mitigation/Management	Responsibility for Implementation	Responsibility for Monitoring
Construction				
Water supply service disruption during repairs	Activities disruptions and loss of income or time	• Develop a communication system such as compiling a resident list of mobile phone numbers (where it is the most common means of communication) and send notifications at least 24 hours prior to any disruptions • Develop proper planning measures to ensure minimal time is taken on repairs.	City of Bulawayo/ Contractors/ Consultant	Municipality
Risk of wastewater overflowing during repairs	• Nuisance to communities living near overflowing sewage • Health problems such as cholera, diarrhea, • Typhoid etc. • Soil contamination	Undertake by-passes and/or use vacuum trucks to immediately remove any impounding sewage.	City of Bulawayo/ Contractors/ Consultant	City of Bulawayo/ Contractors/ Consultant/ EMA
Meter tempering and other asset vandalism	• Resource wastage, • Interference with the proper functioning of the infrastructure • Rendering the system financially unsustainable • hence likelihood of • collapsing	Community awareness	City of Bulawayo/ NGOs/ Consultant	Municipality
Clearing of vegetation	Increased invasion of alien plant species	• Minimal and controlled vegetation clearing • The avoidance of clearing during the wet season • Re-vegetation of cleared areas as soon as is feasible • Minimize vegetation disturbance by constant monitoring and removal of alien species.	City of Bulawayo/ Contractors/ Consultant	Municipality/ EMA
	Interference with wildlife habitats	• Identify significant habitats prior to working at an area	City of Bulawayo/ Contractors/ Consultant	Municipality/ EMA
Digging or minor excavations	Soil erosion	• Use of erosion control measures on sloping ground to prevent the • development of rills and gullies • work to be undertaken during dry season • Control storm water run-off and soil erosion • Limit the circulation of heavy machinery to minimal areas	City of Bulawayo/ Contractors/ Consultant	Municipality/ EMA

		• Plan work in sections to avoid opening up areas that are left open.		
	Increase in ambient dust concentrations (PM 10)	• Wetting areas but taking into consideration erosion control measures • Stopping the digging and excavation on days when the • wind speed is above 20km/hour	City of Bulawayo/ Contractors/ Consultant	Municipality EMA
	Pollution or sedimentation of water courses downstream	• Dig small areas and cover and compact immediately after work is complete	City of Bulawayo/ Contractors/ Consultant	EMA
Storage of fuel chemicals and oil for rehabilitation equipment	Soil pollution and water contamination	• Bunding (110% of the largest possible spill) of all fuels, chemicals and oils storage areas to avoid contamination from spillages • development and implementation of an emergency procedure to minimize the risk of contamination from possible • emergencies • handling of all chemicals in accordance with manufacturers safety instructions • In the event of significant spills, conducting root cause analysis and • Embarking on remedial measures such as containment, removal or in-situ remediation where possible.	City of Bulawayo/ Contractors/ Consultant	EMA Municipality
Trucking of dry sludge to waste disposal sites	Noise and air pollution from trucks	• Development of a traffic management plan with specified routes that are less likely to create a nuisance and chaos for the communities	City of Bulawayo/ Contractors/ Consultant	Municipality EMA
	Risks of accidents and injuries to workers	• Complying with work place legal requirements • Provision of Personal Protective • Equipment (PPE) • Employment of competent work force • Instituting safety drills, disaster preparedness and management programmes	City of Bulawayo/ Contractors/ Consultant	Municipality
	Exhaust Emissions	Using of functional vehicles and Planting of trees to offset the emissions.	City of Bulawayo/ Contractors/Consultant	EMA Municipality
Rehabilitation operations	Fair treatment of employees, worker-management relationships the prevention of unacceptable forms of labour such as child and forced labour	• Develop a workplace Health and Safety Plan that outlines how occupational health and safety (OHS) will be addressed during the rehabilitation project • Manage and mitigate against accidents and injuries to workers • Control hazards and risks exposed to workers and community members including odours and air pollution, mosquito breeding sites, invasive aquatic communities	City of Bulawayo/ Contractors/ Consultant	City of Bulawayo/ Contractors/ Consultant
General Rehabilitation Operations	Community dissatisfaction	• Development of a community Health and Safety Plan that outlines how project-related health and safety risks to local communities will be addressed including how awareness and improve municipal water supply and sewerage services with the aim of contributing to the improvement in health and social wellbeing of the population of the CoB.	City of Bulawayo / NGOs / Consultant	Municipality EMA

		The proposed Project's emphasis is on rehabilitating and enhancing the water supply system, strengthening institutional aspects, enhancing service delivery efficiency and improvement of the environmental sanitation		
		• Development of an emergency response and communication plan. • Develop a public consultation and engagement program that outlines engagement with stakeholders throughout the • rehabilitation and the entire • lifecycle of the project and how the community will be given opportunities to express their concerns about the project, and how it will continue to ensure such opportunities	City of Bulawayo/ Contractors/ Consultant	Municipality EMA (Council monthly reports)
Cleaning of ponds and de-sludging	Waste generation	• Develop a Waste Management Plan that describes the principles of waste management and conduct re-use studies to ensure reduction of pollution levels	City of Bulawayo/ Contractors/ Consultant	Municipality
		• Where the community is closer, activities should be carried out when it is likely to cause less odour in terms of time of day and wind direction	City of Bulawayo/ Contractors/ Consultant	Municipality
	Dust Emissions	Spraying with water	Contractor	EMA
Cutting and breaking of pipes	Asbestos fibre released to the air causing health problems	• Develop procedures for handling the Asbestos Cement • Pipes (ACP).	Contractor	CoB
Post Construction				
Irregular and inconsistent power supply	Deterioration and destruction of motors for pumps	Engaging the electricity authority (ZESA) to connect infrastructure to electrical lines that do not get load shedding	City of Bulawayo	City of Bulawayo AfDB
Post rehabilitation operations	Infrastructure deterioration	• Resource adequately operation and maintenance functions • Increase ability to collect revenues from water and sanitation	City of Bulawayo	Municipality AfDB
	Social divisions over perceived preferential access to safe water 24/7 in towns where the demand exceeds supply even after rehabilitation	• Communication program to raise awareness on challenges of demand exceeding supply in terms of what the available infrastructure can produce • Ensure fair distribution of water supply	City of Bulawayo	Municipality
	Increased energy consumption	• Set energy and water consumption targets and develop a strategy towards achieving them • Use environmentally sensitive equipment instead of replacing the old equipment as is	Municipality	Municipality
Increased water demand/supply & water quality monitoring	Reduced amount of river water flow downstream due to increased water abstraction	• Conduct water quality monitoring at river recharge points • Develop monitoring strategies and penalties for illegal connections and meter tempering.	Municipality	Municipality

Enhancement measures proposed under the project include: proactive Gender mainstreaming into the project, focusing on the employment opportunities to women, members of the vulnerable groups and youth in the area; inclusion of women and representatives of vulnerable groups in important stakeholder meetings to determine their needs and wants as well as potential improvements as the project progresses; construction of public sanitation facilities in market and public places to improve women's (especially girls) hygiene during menstruation as part of the project activities; and CoB and other stakeholders i.e. Ministry of Health and NGOs, to sensitize communities about hygienic practices for handling water to avoid secondary contamination and promote proper sanitation practices among communities. These enhancement measures are further reflected in the table below.

Positive Impacts	Enhancement Measures
Creation of temporary employment to the local people during construction	Give employment priority, where possible, to local people employment (men and women) during construction phase.
Increased income generation to local people, especially women and youth by selling food stuffs to construction workers	Give preference to getting service from the local inputs (food, basic materials, etc.) Create enabling environment for food vendors through construction of temporary shelters with water supply and sanitary facilities.
Reduced incidence of water borne (E.g. cholera and diarrhea) and water washed diseases (E.g. skin infection) due to improved availability of water and improved hygiene and sanitation conditions among the local residents	Intensify awareness and education campaigns on hygiene and sanitation practices among the local residents. Promote household connections to sewerage system in planned areas.
Reduction in water losses	Promote campaigns to ensure that people are legally connected with meters. Enforce legislation to prosecute people who are illegally connected. Create awareness among the people to report leakages in water supply pipes and vandalism by unscrupulous people through use of Call Centre and other platforms.
Improved ground and surface water quality	Promote awareness among the local residents to protect ground and surface water sources against pollution.

5. Environmental and social monitoring program

Monitoring includes monitoring implementation of the proposed mitigation measures to assess their efficiencies and development alternative or supplementary mitigations measures if the expected results are not reached. Contractors will be responsible for implementing the mitigation and improvement measures contained in the ESMP. To ensure social and environmental sustainability of the project, the Implementing Entity (IE), in conjunction with the City of Bulawayo, will be responsible for monitoring all the identified potential impacts and ensuring that the proposed mitigation measures are implemented. The IE will compile half-yearly environmental and social monitoring reports concerning implementation of measures adopted within the framework of the ESMP and the environmental and social problems encountered. The City of Bulawayo has ongoing responsibility for monitoring the provision of water supplies (quantity and quality) and the treatment of sewage and release of effluent to the environment (quantity and quality). The detailed E&S monitoring programme is as follows:

Monitoring Parameter	Monitoring Location	Measurement Unit / Method	Target Level / Standard	Monitoring Frequency	Responsibility for Monitoring
Damaged roads and pavements	Pipe line road crossings Road access points to project sites	Area affected	No traffic flow disruptions	3 months	City of Bulawayo
Disruption of Public Services	Pipeline trenching Other related construction activities	Anticipated volume of affected traffic	No complaints from the public	Entire project duration	
Soil erosion and sedimentation	Pipe line trenches WSP sites Construction sites	Visual inspection	No affected vegetation growth And development of Dongas and Gulleys	Entire operation phase	Supervision consultant (Site Engineer)
Dust and Exhaust fumes emission	Construction site Contractor's camp site Nearest residents outside site boundaries	Visual inspection	No complaints from local residents regarding dust pollution. Construction workers wearing dust protection gears No visible Black Smoke being emitted from construction machinery	Daily	Supervision consultant (Site Engineer)
				After every 1 Month	Environmental Consultant
Construction related accidents	All construction sites	Site risk assessment records Accident reports	No reported incidents	Daily	Supervision consultant (Site Engineer)
Traffic flow and public mobility	Pipeline road crossings Affected properties	Visual inspection	No public complaints	Entire construction phase	City of Bulawayo
Noise reduction	At construction sites	Complaints	No public complaints and workers	Daily	Supervision consultant (Site Engineer) Environmental Consultant
Soil Pollution	Pipeline trenching Dumping of construction rubble WSP sites	Visual Soil tests	No stunted growth of vegetation	Entire construction phase	Supervision consultant (Site Engineer) Environmental Consultant
Ground and Surface water pollution	Sewer pipe line diversions WSP sites Oil and fuel spillages on site	Water quality test results Visual and odour	No public complaints of immediate users and those down stream No odour	Entire construction phase	Supervision consultant (Site Engineer) Environmental Consultant

Monitoring Parameter	Monitoring Location	Measurement Unit / Method	Target Level / Standard	Monitoring Frequency	Responsibility for Monitoring
Health and Safety	All construction work sites	Safety and Health site files	Site SHE files conformity	Entire construction phase	Supervision consultant (Site Engineer)
Odour nuisance	Sewer pipelines working zones WSP/ Wastewater treatment plants	Complaints from nearby residents	No public complaints	Entire construction phase	Environmental Consultant
Toxic industrial effluent	WSP and Waste water treatment plants Solid waste management sites	Visual Odour Quality tests	No reported deaths of animal and bird life Odour and smell	Entire construction phase	Environmental Consultant
Water resources management	Community water users Institutions	Water demand per capita – meter readings Zone meters	Water allocations not surpassed or abused	Entire construction phase	City of Bulawayo

6. Public consultations and disclosure requirements

The ESMP will be availed to the relevant communities and additional impacts identified will be incorporated into the document. While public consultations were not conducted due to the localization and magnitude of the project and the fact that most of the upgrades are similar to normal day to day running of the plants with very little impact on the surrounding communities, the AfDB project appraisal team held meetings with a number of stakeholders including resident associations, NGOs and business associations, who expressed an urgent need for the proposed activities and whose inputs helped inform the project scope. It is worth noting that municipal budgets and other developments are approved by the council, amounting therefore to indirect consultations with the public because counsellors represent the communities. The ESMP summary will be posted on the AfDB website and made available to the AfDB Board 30 days prior to project submission.

Specific consultative issues and respective actors are shown in the following table:

Mitigation/Enhancement Measures	Stakeholders to be Consulted	Purpose of Consultation	Time/Frequency of Consultation
Enhancement Measures			
Proactive Gender mainstreaming	CoB, Gender pressure groups, NGOs	To avoid social conflict that may affect the proper implementation of the project	During project preparation
Inclusion of women and representatives of vulnerable groups in important stakeholder meetings	CoB, Gender pressure groups, NGOs	To avoid social conflict that may affect the proper implementation of the project	
Timely preventative maintenance of facilities and provision of appropriate work inputs	CoB	To facilitate a smooth management of works	Project and ESMP implementation
Repairing of public sanitation facilities	CoB, EMA, affected communities	To control incidents of cholera epidemic and other related diseases	
Sensitize communities about hygienic practices	Policy makers, Residents Associations, NGOs (liaise)	To control incidents of cholera epidemic	
Pressure rezoning to improve water losses and improve water availability	CoB, Affected communities	To improve system management and monitoring	During the construction of the project
Mitigation Measures			
Ensure that vegetation is cleared and excavations are done as designed to avoid unwarranted clearance of vegetation	EMA, CoB	To avoid and minimise unwarranted environmental degradation	During the construction of the project
Rehabilitate affected land by tilling the soils to facilitate natural regeneration of vegetation	EMA, CoB	To avoid human accidents and complaints	In all phases of project and ESMP

			implementation
The routing pipe layouts and access roads should follow areas with as little vegetation as possible	EMA, CoB, Property owners	To avoid and minimise unwarranted environmental degradation & minimise residents conflicts	During the construction of the project
Minimize the number and length of access roads and use existing roads or tracks as far as possible	CoB	To avoid and minimise unwarranted environmental degradation & minimise residents conflicts	
Ensure that construction vehicles and plant i.e. tippers, excavators, compactors etc. use only designated access roads to avoid degradation of soils outside designated zones	CoB, Affected communities	To avoid grievances and degradation of existing road infrastructure. To ensure proper and timely movement of public transport system and public mobility	In all phases of project and ESMP implementation
Sprinkle water on designated earth access roads and construction sites to minimise dust emissions	CoB, Affected communities	To avoid complaints by surrounding communities	
Sensitization of communities on health, hygiene and HIV/AIDs awareness	CoB, Community / School health clubs	To control incidents of STD/HIV-AIDS epidemic	
Maintenance of downstream environmental flows from Khami and Umguza Rivers	EMA, Umguza district Council / CoB	To avoid and minimise unwarranted environmental pollution To ensure that the public is not serious affected To reduce public compliances and grievances	

7. Institutional arrangements and capacity building requirements

The CoB's Environmental issues are monitored under the Engineering Services Department (ESD) which is responsible for implementing and monitoring environmental, social and climate change activities. The ESD has over the years supervised rehabilitation works on water mains renewal and meter replacement programs to reduce NRW as well repairing of outfall sewers to reduce environmental pollution. However, even though the CoB will have overall responsibility to ensure that all components of the project comply with the ESMP and will compile an annual environmental monitoring and audit report to the Bank, some external support –accommodated in the project scope– will be required in the form of outsourcing for a Consultant to specifically manage the requirements of the ESMP on behalf of the Municipality. The Consultant will be expected to capacitate CoB staff. It is also suggested that the staff within the PIT responsible for Social and Environmental issues be attached to the Consultant firm responsible for such activities untill project completion, as a way of skills transfer, which ensures sustainability of such practices beyond the present project. It is

envisaged that ten (10) CoB staff members from various departments involved in the project will benefit from on the job training, the costs of which will be catered for under capacity building.

The institutional arrangements for the implementation of the EMSP are highlighted in the following table:

Organization	Designation	Responsibility
AfDB	Donor/Funder	• To provide financial support to the project and ESMP • To provide technical and supervisory support • To review environmental and social impacts Report regularly
CoB Management	Borrower and Project implementers	• To oversee and assist the Contractor • Environmental experts in ESMP Implementation during construction • To ensure the effective implementation of ESMP by putting in place monitoring and evaluation programs for ESMP • Provide strategic, policy and operational guidance
Contractor	Contractor	• To implement specific tasks plucked out of the main ESMP during Construction
CoB & Supervising Consultant	Supervisors	• Co-ordinates implementation of ESMP • Implementation of mitigation Plan • Monitors mitigation plan and health safety management plan (implementation of monitoring plan) • Provides progress report of implementation of ESMP to Steering Committee and EMA • Oversee the inter-institutional coordination for environmental mitigation, monitoring and supervision
Local Government	Supervisors	• Supports implementation of mitigation Plan through regular monitoring • Mobilization of communities on catchment management activities and sensitization programs • Supports monitoring of the mitigation plan and health safety management plan • To ensure that the project and the contractor do not violate all public policies/ rules and regulation
Local Community	Supervisory and advisory roles	• Liaison with the contractor and CoB in the implementation of ESMP • Provide specific and localized advise on water resources management, and especially in the catchment areas
EMA	Supervisory and advisory role	• To ensure CoB and Contractors adhere to the existing environmental policy requirement in the course of Project and ESMP implementation • To conduct planned and unplanned site inspection so as to enforce environmental policy compliance.

8. Estimated costs

With the exception of the community water, sanitation and hygiene awareness and outreach component, all mitigation measures identified in the ESMP form part of the activities of the project components and are inherently mainstreamed in project activities. The costs of the community awareness and outreach component are estimated at USD 400,000. The table below provides the project ESMP costs and timeline.

Remove hazards from raw sewage in residential areas	• Identify blocked and leaking sewer lines and repair them • Remove sewage using vacuum trucks during repair to avoid overflow	Project duration	Included in the wastewater component costs
Develop plan for dealing with burst or leaking pipes	Increase capacity of CoB in operation and maintenance	Project duration and beyond	Rehabilitation and Capacity Building components
Conduct leak detection exercises along the water supply pipeline	Identify areas where there is leaks along the pipeline and repair them	Project duration	Rehabilitation and capacity building components
Community awareness	Raise awareness on preservation of public assets, water conservation, demand management aspects and individual responsibilities regarding water losses and pollution from the sewer	Project duration	USD 400,000.00
Erosion control measures	Managing sloping ground to prevent the development of rills and gullies, working during dry season; limiting the circulation of heavy machinery to minimal areas and working in sections to avoid having areas that are left open	Project duration	Rehabilitation component Part of the contractor general cost
Dust control measures	Wetting areas but taking into consideration erosion control measures; stopping the digging and excavation on days when the wind speed is above 20 km/hour and digging small areas and covering and compact immediately after work is complete	Project duration	Rehabilitation component Part of the contractor general cost
Occupational health and safety management measures	• Complying with work place legal requirements • Provision of Protective • Professional Equipment • Employment of competent work force • Instituting Safety drills, disaster preparedness and • Management programmes	Project duration	Rehabilitation component Part of the contractor general cost
Climate Change management measure	• Use of functional vehicles	Project duration	Rehabilitation component Part of the contractor general cost
Communication Program to attract more	Advertising the areas as water secure places for businesses to invest	Project duration and beyond	Rehabilitation and Capacity Building components

industries			
Waste management measures	Identifying waste materials and following the waste hierarchy in getting rid of the waste	Project duration	Rehabilitation component
Nuisance management measures	Working on sludge issues and ponds when it is likely to cause less odour in terms of time of the day and wind direction	Project duration	Rehabilitation component Part of the contractor general cost
Coordination with other agencies having infrastructure assets	Harmonisation of plans and coordination of activities for minimal disruptions	Project duration	Rehabilitation Component part of the contractor general cost
Resource conservation measures and climate change mitigation	• Conduct water quality monitoring at river recharge points • Develop monitoring strategies and penalties for • illegal connections and • meter tempering	Project duration	No additional cost as ZINWA & EMA already monitors rivers.

9. Implementation schedule and reporting

The Project Implementation Team (PIT) of this project shall be involved together with the consultancy firm to oversee the implementation of the ESMP and in accordance with the monitoring plan and reporting schedules. It is envisaged that the CoB will engage an independent environmental consultant to carry out environmental compliance monitoring. The Contractor shall be responsible for implementation of environmental and social mitigation measures under the supervision of the consultancy firm / PIT and environmental consultant. This is to ensure that technical and environmental clauses are followed and well implemented by the Contractor.

All mitigation and enhancement measures should be implemented whenever necessary in all phases of the project. As mentioned earlier, progress on the implementation of the ESMP will be included in the overall periodic progress reports, midterm review and monitoring and evaluation reports of the project that is to be sent to EMA and the AfDB.

Implementation of the project will be executed as will be stipulated in the contracts between financier, client and contractor. However in terms of the proposed ESMP, the Contractor will have to prepare quarterly compliance reports. The CoB through environmental consultants will also prepare quarterly report on the status of the implementation of proposed ESMP by contractor and actors, and propose appropriate measures for improvement.

Other measures which have been proposed in this ESMP will need separate implementation and reporting due to the fact that they will not be implemented by the contractor. These separate measures include:

- Environmental conservation education to all communities in the targeted wards as well as school children.

- Facilitation of formation and maintaining community based environmental conservation clubs.
- Development of Water Resources Management plan.
- Preparation of Climate Change adaptation measures.

The above mentioned measures will be implemented by the consultant and reported directly to the CoB and financier (AfDB) and assessment criteria will be determined during project implementation.

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10. Conclusion

It is expected that the project will greatly improve efficiency in the water systems, reduce environmental pollution, strengthen institutional capacity and improve access and service delivery in all the 21 wards in targeted project area. In this respect, the project will provide much needed sanitation services in the form construction of outfall sewers and will result in improved health and quality of life of city residents. The negative impacts of the project can all be managed as no irreversible or serious adverse impacts are anticipated provided all proposed mitigation measures are implemented, that the contractor operates in a diligent manner, the quality of final effluent discharges, sludge and back wash are monitored and managed, and that during operation the SAST plant functions optimally.

For sustainability of the Project, management activities must be efficiently and effectively implemented, in collaboration with the expert stakeholder institutions. The committees involved in the project at various levels of implementation should be gender balanced. CoB and the respective key stakeholders are expected to ensure that employment opportunities to be created by the project are inclusive of women and youth groups, in an endeavor to eliminate gender imbalances prevailing in the proposed project area. Where appropriate, employment of local people from the project area must be prioritized to encourage community ownership and sustainability of the project

In general, the project has been found to be environmentally, socially and economically beneficial and is expected to contribute towards poverty alleviation. The socio-economic benefits accrued from the project include improved health and quality of life among the local residents due provision of reliable and safe water supply and sanitation. The health of the targeted communities is expected to improve due to increased access to clean, safe potable water, and improved sanitation. Economically the communities will benefit due to savings from money spent on medical services due to reduced incidence of water borne diseases, and increased productivity due to increased availability of water supply for various productive activities. Another economic benefit will accrue from increased revenue collection by CoB due to increased supply, improved accountability system volume measuring devices and anticipated reduction in NRW.

From an environmental point of view, the project will help to promote awareness among the local communities on the importance of protecting the Municipal infrastructure (their assets) as part of the integrated water resource management. Although the project has been found to have positive impacts there are also some adverse (negative) impacts. In this regard, mitigation measures have been proposed for negative impacts and enhancement measures for positive

impacts. The Environmental and Social Management Plan (ESMP) has been developed to implement the proposed mitigation and enhancement measures. Furthermore, the Environmental and Social Monitoring Plan has been incorporated into the ESMP to ensure that the proposed mitigation measures are complied with during project implementation. It is expected therefore that the CoB and all the key stakeholders will combine their efforts to ensure effective and efficient implementation of this ESMP for the sustainability of the project.

11. References and contacts

African Development Bank
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