ZIMBABWE NATIONAL WATER PROJECT

ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP)

FOR

ZIMUNYA WATER SUPPLY SUBPROJECT

MUTARE RURAL DISTRICT

MANICALAND PROVINCE

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Abbreviations

AGRITEX	Agriculture Technical and Extension Services
AIDS	Acquired Immunity Deficiency Syndrome
CMB	Cotton Marketing Board
DA	District Administrator
EMA	Environmental Management Agency
EMP	Environmental Management Plan
ESMP	Environment and Social Management Plan
GMB	Grain Marketing Board
HIV	Human Immunodeficiency Virus
RDC	Rural District Council
SI	Statutory Instrument
STD	Sexually Transmitted Disease
ZESA	Zimbabwe Electricity Supply Authority
ZINWA	Zimbabwe National Water Authority

EXECUTIVE SUMMARY

Introduction

The Government of Zimbabwe has made a request to the World Bank for financial support to finance a Zimunya Water Supply Station Improvement Project to be implemented by ZINWA.

The project components tentatively include

(i) Investment in repair and rehabilitation of critical infrastructure in selected water supply stations managed by ZINWA

(ii) Institutional strengthening of ZINWA including project development and design, financial management, procurement project management and monitoring

(iii) Technical assistance to assess options for transforming ZINWA to enable it to perform its mandate more efficiently; and

(iv) Strengthening the capacity of urban and rural local authorities to contract with and oversee operations managed by ZINWA in line with their new mandate of being Water and Sanitation Authorities under the new water policy. A needs assessment survey of Growth Points in Save Catchment resulted in the prioritization of one station (Zimunya). As part of the assistance to ZINWA to fully prepare subprojects in, ZINWA Save Catchment stations for investment, Castalia reviewed preliminary safeguards (environmental and social) assessment carried out by ZINWA for the (one) priority areas.

Study Methodology

The safeguards assessments and tools were pitched at a level that satisfies requirements of the Zimbabwe legislation for environmental management (Environmental Management Act) and the relevant World Bank safeguards policies.

Tasks undertaken for the project included an outline description of the baseline environmental setting, identification and analysis of expected, known and predicted direct, indirect, cumulative, short and long term as well reversible and irreversible impacts of the project during the planning, construction, operation. The description of the environmental setting and the analysis of identified and predicted impacts were subdivided into biophysical and socio-economic realms. An important insight into the people centered issues was obtained through a limited Stakeholder Consultation with some key stakeholders who included households and key institutions.

The ESMP study was expressly meant to specify and propose measures for avoiding or mitigating the identified and predicted negative impacts while equally specifying and proposing ways of enhancing and boosting all identified and predicted positive impacts.

Legal and Institutional Framing

Zimbabwe's EIA policy emphasizes sustainability principles in project planning, construction, operation as well as in evaluation and monitoring. It is also based on the understanding that many decisions concerning the environment are dependent upon meaningful public consultation and that upon being accepted, various government agencies with a mandated interest which include the Environmental Management Agency (EMA), should implement the EIA/ESMP results on behalf of the Ministry of Environment Water and Climate. The latter is part of the EIA/ESMP review process. The EIA policy also explicitly pays particular attention to the distribution of project costs and benefits in the spirit that as much as possible, development projects should support local as well as national growth.

The promulgation of the Environmental Management Act (Chapter 20:27) of 2002 and a number of supporting Statutory Instruments (SIs) listed below now provide a one stop environmental management regulatory package. The establishment of the Environmental Management Agency in November 2006 further consolidated the environmental management function, thereby doing away with duplication and overlaps in the various Government Ministries and Departments with respect to the same function. Some of the SIs enacted in support of the Act are;

a.) Statutory Instrument 6 of 2007 – Environmental Management (Effluent and Solid Waste Disposal) Regulations, 2007;
b.) Statutory Instrument 7 of 2007 - Environmental Management (Environmental Impact Assessment and Ecosystems Protection) Regulations, 2007;
c.) Statutory Instrument 10 of 2007 – Environmental Management (Hazardous Waste Management) Regulations, 2007;

d.) Statutory Instrument 12 of 2007 – Environmental Management (Hazardous Substances, Pesticides and Other Toxic Substances) Regulations, 2007 and,
e.) Statutory Instrument 72 of 2009 - Environmental Management (Atmospheric Pollution Control) Regulations, 2009

The relevant World Bank policies reviewed include:

- O.P 4.01 - Environmental Assessment.
- OP 4.04 - Natural Habitats
- OP 4.36 – Forests
- OP 4.11 - Physical Cultural Resources

- OP 4.12 - Involuntary Resettlement

In screening the projects, it was concluded that the water projects are Category B as they are occurring in already disturbed environments. Impacts on the relevant policies above are very minimal and can be easily mitigated. The compilation of a detailed prospectus which has been submitted to EMA is a first step in the fulfillment of local project screening guidelines. An argument has been made that EIA exemption needs to be granted for these 7 sub projects given the reasons above.

Existing Environment

The baseline data included relief and drainage, climate data, inventory and distribution of flora and fauna, land-use patterns, and related socio-economic attributes and statistics.

Stakeholder Consultation

This involved questionnaire and interviews with institutions such as RDCs, Government ministries (Minis), Schools and Hospitals as well as residents.

Analysis of Environmental Impacts

There are both positive and negative impacts which are predicted to result from project implementation. A number of the socio-economic impacts during the construction and operation such as employment generation and improved availability of water are positive. Most of the biophysical impacts from planning through to operation are negative and likely to occur but are very few and of a limited nature. These include soil disturbance, reduction of biodiversity through cutting trees, deterioration of air quality and hydrological impacts. These impacts occur within converted/already built-up areas and can be adequately mitigated or in some cases removed through the use of appropriate technology, preventive maintenance and the diligent and prudent application of Safety, Health and Environment (SHE) practices. Most planning and construction phase negative impacts are of limited duration, magnitude and extent with high mitigatory potential. Operational phase biophysical negative impacts are related to increased waste water production as a direct result of the ready availability of water. The projects will have positive social impacts during the operation phase. These relate to improved hygiene, starting income generating projects, local economic development, staff retention, and general improvement in the quality of life of people. The projects are not going to result in the displacement of people or disturb physical natural resources. Their impacts on the Bank's policy areas are very minimal and as such can be easily mitigated.

Environmental Management and Monitoring Plan

An Environmental Monitoring and Management Plan (EMMP) is the summarized management plan in this ESMP and is outlined for avoiding/mitigating negative impacts and enhancing/boosting positive impacts. The EMMP buttresses the sustenance of existing environmental management interventions, as well as continuous monitoring of critical environmental parameters. Mitigation costs incurred in the implementation of some of the environmental protection initiatives are generally very low and can be easily offset by recovered benefits of more water, better hygiene and sanitary health.

Conclusions and Recommendations

The refurbishment and upgrade engineering works planned for the seven priority stations will largely be limited to replacement/upgrading of pumps and motors, raw and clear water mains/pipelines, reservoir tanks and in most cases, backwash mains and settling ponds.

All engineering works will be undertaken within already converted land uses, which imply very limited negative biophysical or even socio-economic interference with environmental/ecological systems and services as well as livelihoods and social well being of the neighboring and interested human communities. The minor negative biophysical impacts related to the construction and operation phases (construction equipment/vehicle and construction work force related pollution and externalities and consequences of increasing numbers of residents due to availability of water) can all be adequately mitigated. Furthermore, the health and livelihoods gains by the affected communities from these subprojects are so huge and are bound to overwhelm the minor negative impacts with high mitigatory potential. None of the subproject activities and impacts are expected to trigger any of the World Bank Environmental and Social Safeguard policies except Environmental Assessment. It is important however to integrate issues of sanitation management in the wake of increased volumes of water available to residents as it will certainly translate to larger volumes of waste water released into the environment.

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1. Introduction

1.1 Ministry of Water, Environment and Climate

1.2 Zinwa

The Zimbabwe National Water Authority (ZINWA) is a national organisation, responsible for water resources development and management and providing treated drinking water to small towns, growth centres and government establishments in Zimbabwe. ZINWA has seven sub-offices (catchments) which are based on the seven hydrological catchments in Zimbabwe. ZINWA was established under the ZINWA Act of 1998 and is a body corporate institution which operates on a commercial basis.

In the last decade or so, the performance of ZINWA has been affected by many factors including the economic collapse which resulted in under- funding of both O&M and capital investment. The economic collapse also resulted in loss of skilled human resources especially to neighbouring countries. As such infrastructure deteriorated resulting in poor service delivery. Consequently customers became unhappy and unwilling to pay for the services leading to low revenue collection. This further reduced the capacity of ZINWA to operate the water and sanitation systems effectively. This did not only affect ZINWA, but also other agencies tasked to provide water and sanitation services in Zimbabwe such as local authorities. The collapse of the water and sanitation services in Zimbabwe was linked to the 2008/9 cholera outbreak which affected over 100,000 people and resulted in about 4,300 deaths.

ZINWA operates about 500 water supply stations throughout Zimbabwe. The systems are an assortment of conventional water treatment and supply networks, groundwater fed systems and sand abstraction systems. Most of the water supply systems are in need of urgent repair and rehabilitation. Water supply is erratic in most areas due to the reduced capacity of the systems coupled with recurrent breakdown of key equipment and components of the systems. There are a lot of areas were water and sanitation coverage is below 100%. In such areas communities have resorted to other alternative forms of water supply, many of them unsafe. Over the last few years especially after the cholera outbreak of 2008/9, a number of activities have been carried out mainly by NGOs and donors to restore and improve water supply and sanitation services in Zimbabwe including in areas managed by ZINWA .The aim has been to prevent a repeat of the cholera outbreak and preserve the water and sanitation infrastructure. However a lot still needs to be done in order to completely restore services and achieve sustainability.

1.3 Overview of the Zimbabwe National Water Project

The Zimbabwe National Water Authority (ZINWA) is a national organisation, responsible for water resources development and management and providing treated drinking water to small towns, growth centres and government establishments in Zimbabwe. ZINWA has seven sub-offices (catchments) which are based on the seven hydrological catchments in Zimbabwe. ZINWA was established under the ZINWA Act of 1998 and is a body corporate institution which operates on a commercial basis.

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The priority station that have been identified in Save Catchment, for pilot project implementation is listed in table 1 below.

Table 1: The stations for the project

Catchment Area	**Station**
Save	Zimunya

1.4 Scope of the ESMP

The ESMP study was expressly meant to specify and propose measures for avoiding or mitigating the identified and predicted negative impacts while equally specifying and proposing ways of enhancing and boosting all identified and predicted positive impacts.

1.5 Potential users of the ESMP

There are various stakeholders that may find this ESMP useful. ZINWA may use this EMP for project implementation and monitoring. Contractors can find this EMP useful for project implementation. This EMP will constitute part of the bidding documents for contractors and as such it will be a requirement for the contractors to deliver the requirements of this ESMP

This EMP is important for the general public for ensuring that their interests are covered and also their informed participation in the project design, implementation, monitoring and evaluation. This EMP can be used by different institutions in monitoring and these institutions include RDC, EMA and NSSA.

Chapter 2

2.1 Project location

Zimunya is located in Manicaland Province and is situated approximately 20 kilometers south of Mutare along the Mutare-Masvingo highway. Zimunya is a peri-urban area in ward 32 of Mutare district. The responsible local authority is the Mutare Rural District Council. The geographic coordinates are 17,816460 S; 31,112290 E.

Figure 1 – Location of Zimunya

Zimunya Water Supply Station falls within the Save Catchment as demarcated by the hydrological boundaries in Zimbabwe managed by the Zimbabwe National Water Authority (Zinwa). The water supply station supplies potable water to Zimunya and its surrounding areas.

Figure 2- Schematic of the Zimunya water supply system

Zimunya Township

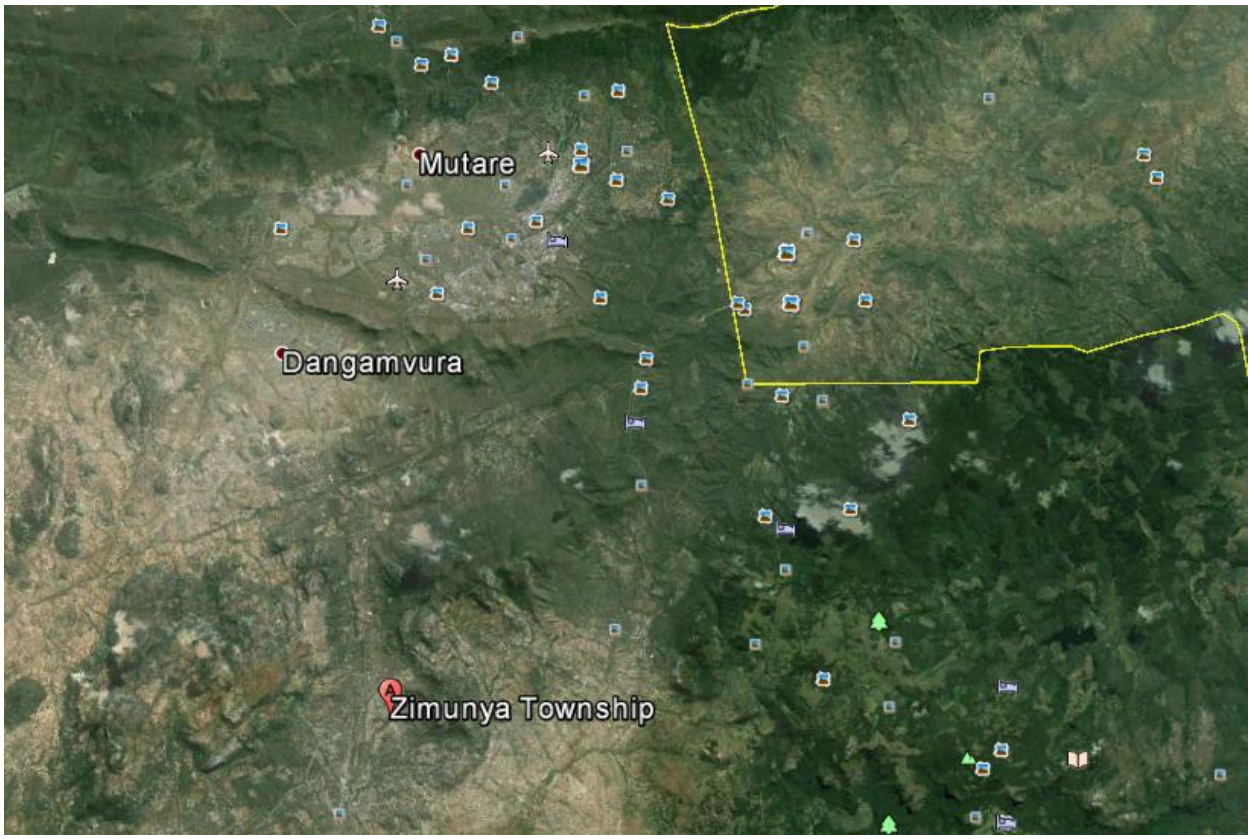


Figure 2: Zimunya Township (courtesy of Google Earth)

2.2 Project description

Introduction

Zimunya's population is estimated at about 6 000 consisting of about 700 connected households and about 600 households requiring connection. The project is aimed at connecting the 600 households and boosting supplies to the 700 connected households who are receiving erratic supplies. Zimunya Water Supply will also cater for 3 primary schools, a secondary school and a clinic with a maternity ward. Zimunya is a very rapidly growing dormitory small town as it is a preferred residential site for most of the low income groups working in Mutare's backstreet industries.

The raw water source for the Zimunya Water Supply Project is from both Zimunya Dam (with a capacity of 912 ML) and the Mpudzi Weir. Currently the Mpudzi Weir is the sole source of raw water with a nearby water treatment plant (with a capacity of 50 m3/hr which is 50% of current

demand). Raw water is envisaged to pass through a full treatment plant located close to the abstraction weir. After treatment, the water will be pumped to a booster station about 2.5km away where it is pumped into reservoir tanks another 2 km away. Water will then gravitate from the reservoir tanks to the beneficiaries. The project is largely about the boosting of pumping and storage capacity of the water supply system.

Projected Summary Scope of Works

- Replace clear water pumping main, dosing equipment, several motors, pumps and valves
- Rehabilitate intake tower dam abstraction, existing reservoirs
- Construct sedimentation tank, filter unit and water sump and new distribution pipework connection

2.2.1 Current Water supply services

Zimunya water supply station is operated and managed by an Operator-in-Charge and an assistant Operator who oversee the daily operations, maintenance and management of the water supply station. There are 5 other general assistants who help with operations between the treatment plant and the booster pumping station. They are also responsible for maintenance and repair of all assets and components associated with these stations. The station operators report to the catchment Operations Engineer who provides technical support for the station and oversees all management issues to do with efficient and effective management of the stations. The Operations engineer would then report to the Operations Manager, and Operations Manager to the Catchment Manager. Management of water supply services is through the Operation unit of Zinwa.

2.2.1 Available sources of water

Zimunya water works receives raw water from the Zimunya Dam and the Mpudzi River. There are two types of abstraction that feed raw water to the treatment plant. The first, is a 150mm diameter gravity pipeline from the Zimunya Dam gravitating from the dam to the station for a distance of approximately 1.5 kilometers. This gravity pipe abstracts water through the dam wall by bottom suction. The second abstraction system, is through pipe abstraction directly from the Mpudzi River, through a weir, via a 200mm and 150mm diameter pipe and into an open channel. The open channel then feeds the station through suction pipes on foot valves located in an inlet chamber. Water is drawn via centrifugal pumps and into the sedimentation tanks.
Currently, the Zimunya Dam and the Mpudzi River are the only sources of water supplying the station. Zimunya Dam has a storage capacity of 912 mega litres.

2.2.2 Existing water supply system components

a. The capacity and condition of intake civil works and raw water transmission mains

There is a bottom suction system at Zimunya Dam where raw water is abstracted from. During dam construction, a concrete inlet tower was constructed and fixed to it a 150mm diameter suction pipe withdrawing water from the bottom part of the dam. The inlet tower at present is in good condition, however there are challenges with the quality of water being abstracted through this bottom suction pipe. Operators report that the quality of water is poor especially during rainy season when the dam suffers from siltation and high levels of turbidity. This poor quality water results in more chemicals being used at the treatment plant. The river intake consists of two pipes that draw water from a constructed weir along the Mpudzi River and discharge into an open channel of 300mm wide and 80m long. Water flows by gravity into the channel. The open channel and inlet box chamber where the foot valves are houses is in poor condition and requires its walls to be raised to avoid sand being washed in and silting up the channel.

b. Sufficiency of supply

Currently, the demand outweighs the supply. Zimunya water supply station is facing huge challenges of providing sufficient water for the community. As water is being produced, consumption is simultaneously withdrawing from the storage tanks. There are areas that go without water for long periods and the situation is worse when there is no power due to electricity load-shedding schedules.

c. **Capacity and condition of sedimentation tanks and filters**

There are two sedimentation tanks at the treatment plant of 400m3 each. Sedimentation tank No. 2 was recently repaired and repainted and is currently in good condition. Sedimentation tank No. 1 was not addressed and currently has sections that are leaking slowly. There are two circular filters of capacity 11.5m3 each and another circular filter tank of 23m3. All filter tanks are operational and are in good condition.

d. Chemical treatment

The original dosing equipment is no longer in use. These dosing machines were housed in a separate dosing building and were used primarily to dose the raw water at strategic points. However, over the years, these machines stopped working and manual dosing is now the common method being used. Aluminum Sulphate and Soda Ash (lime) are being dosed manually through ‘Hole-in-bucket’ method directly into the flocculation chambers of the sedimentation tanks.

e. Capacity and condition of clear water transmission

There are two clear water sumps. Both sumps have a capacity of 80m3 each. The condition of both sumps is generally commendable. There are no problems with these tanks except for the condition of the roofs. The contact of chlorine on the iron corrugated roofing sheets over time has resulted in the roof sheets being eroded and leaving holes in the roof.

The clear water pumping main up to the booster pumping station runs for approximately 1.5 kilometres and is a 150mm diameter AC pipe. This main is reported to have frequent pipe bursts mainly due to the lack of non-return valves and the effect of water hammer on the pipe. Furthermore, the air valves along this transmission main do not function as required.

f. Capacity and condition of storage

The booster pumping station feeds four number 250m3 storage reservoirs located on a hill top. These four reservoirs then feed into a concrete 900m3 storage reservoir that then supplies the community. However, during the time of the field trip, two storage reservoirs (250m3) were disconnected and not operating. These two reservoirs were decommissioned due to the collapse of their roofs. The physical condition of all storage reservoirs working at the time was generally good. The 150mm diameter pipe supplying the 900m3 reservoir was also in good condition.

g. Distribution system analysis including service connections and meters or water points

There are approximately 798 water connection points with water meters. Of these water users, about 670 are active, and the balance is disconnected. Distribution to the users is rather erratic due to power load-shedding affecting the production and pumping of clear water. There are also challenges experienced with the distribution transmission pipework as it frequently leaks and bursts at certain sections from time to time. This affects the water users to a large extent.

h. Service pressures

Currently at Zimunya water works, there is no instrumentation in the form of pressure gauges to measure and record water pressures at the station and at the distribution service points.

2.2.3 Proposed improvement program

2.2.3 Available sources of water

Zimunya water works receives raw water from the Zimunya Dam and the Mpudzi River. There are two types of abstraction that feed raw water to the treatment plant. The first, is a 150mm diameter gravity pipeline from the Zimunya Dam gravitating from the dam to the station for a distance of approximately 1.5 kilometers. This gravity pipe abstracts water through the dam wall by bottom suction. The second abstraction system, is through pipe abstraction directly from the Mpudzi River, through a weir, via a 200mm and 150mm diameter pipe and into an open channel. The open channel then feeds the station through suction pipes on foot valves located in an inlet chamber. Water is drawn via centrifugal pumps and into the sedimentation tanks. Currently, the Zimunya Dam and the Mpudzi River are the only sources of water supplying the station. Zimunya Dam has a storage capacity of 912 mega litres.

The available water from Zimunya dam and Mpudzi River is more than sufficient for subprojects needs. There are no adverse downstream environmental impacts due to increased water abstraction due to increased water abstraction. There is no regulation of water from the dam outlet because there is Nyamatikiti, a perennial tributary that augment the flows in Mpudzi River before the abstraction point at the weir.

The station capacity is $50m^3$ per hour translating to $1,200m^3$ per day or $36,000m^3$ per month. In 2002, Zimunya Water Supply sold $334,090m^3$ and in May of the same year 30,438m3 was sold. In that same year, Zimunya dam was 100% full meaning that even if another Water Treatment Plant with the same capacity is constructed, the dam levels will not be greatly affected. Zimunya dam is solely for Zimunya water Supply. There are no commercial water users for Zimunya dam and Mpudzi River.

Downstream, there is Mpudzi dam with a capacity of 12,146 mega litres that is at 98.4% full. There are also no commercial water users for Mpudzi dam even downstream until it flows into Odzi River.

2. 2.4 Justification for selection of the station

The need and demand for improvements – Zimunya Water Supply Station requires a significant level of improvement. The area is growing and the demand for water is ever increasing due to the high number of people from Mutare moving into the area. The lack of adequate funding to repair, replace and even to some extent expand works has been a major challenge.

Pro poor impact – improved water supply services would greatly have a positive impact on the poorer communities. This is the sentiment the field team got during random interviews with residents in the high density communities.

Absence of exiting projects in the area – there are no known projects to augment water supply within the area.

Level of readiness as demonstrated by existing project designs and knowledge of operators – the Catchment office have demonstrated readiness to embark on expansion projects to increase and boost water supply. Drawings and documentation are available at the catchment offices in Mutare.

Funding requirements including amount of funds required – project estimate for funding as estimated by the Catchment Manager's Office is approximately US$800,000.

In summary, is the station a) High, b) Moderate, or c) Low priority for financing. – from investigations and field report, Zimunya is a station that requires attention and station expansion to meet the ever increasing demand of water within the area. Priority can be regarded as high.

Expected impact

a. People connected to good, safe drinking water – high impact

b. People with improved access – high

c. People with increased quantity of water (lpcd) – high

d. People with improved quality of drinking water - high

e. Increased water production to meet demand (current and/or projected) – high

f. Increase in revenue collection and cost recovery – high

g. Increase in management and operation capability and operational efficiency, e.g.,

2.3 Project Cost

The costs for implementation and monitoring of this ESMP of this sub-project has been included in the Project Management Costs of the whole project.

2.3.1 Immediate improvements

These are short term investment needs that are urgent such as where chlorinators are broken and people are drinking contaminated water, these will be quick fixes that are generally low cost but make a big impact. It also includes emergency rehabilitation where this has a significant impact on water supply such as when the transmission mains is suffering repeated failure. It can also include existing projects that are ready to be implemented. It will also include management and operation improvement such as instrumentation (meters and gauges), improved record keeping, organization and HR improvements like training programs, etc

1. Description of work 2. Equipment package for leak detection 3. House to house survey 4. Topographical survey 5. Refurbish river intake canal 6. Replace existing inlet screens 7. Supply and fix new water meter (150mm) 8. Supply 3 x foot valves 9. Supply and fix new 3 x filter media 10. Supply and install new pressure gauges 11. Replace worn out 100 and 150mm dia gate valves 12. Replace worn out 150mm dia scour valves 13. Dosing equipment 14. Provide dewatering pump 15. Supply and fix non return valve at booster 16. Replace clear water pumping main 200mm	**Total cost estimate=333361.30 al costs**

2.3.2 Medium term improvement and costing

These are related to rehabilitation or renewal of existing assets such as replacing old pumps, leaking pipes or service connections, it will include improvement such ass re engineering distribution networks, installing new service connections in existing service areas.

Description	**Costs**
1. Establish 2 pilot DMAs 2. Provision for pipe network rehabilitation including distribution mains, service pipes, valves etc 3. Supply and install new pump sets – raw and clear pump/station 4. Supply and install new motor sets – raw and clear pump/station 5. MCC breakers/starters and cables-30kw and 90kw 6. Constructing new reticulation main (existing service areas)	Total cost estimates= 360 238.32

7. Bicycles 8. Rehabilitate intake tower dam abstraction.	

2.3.3 Long-term improvements and costing

These are cost ant take time to implement such as new ssource and transmission works, augmenting treatment and storage, network expansion, new connections in new service areas, etc

Description	**Costs**
1. Construct 50 m3/hr sedimentation tank 2. Construct 50 m3/hr filter unit- 500m3 3. Construct 100m3 clear water sump 4. Rehabilitation work on the existing reservoirs 5. Erect a fence at storage site	Total cost estimates= 407 700.00

Chapter 3

Legal and Institutional Framework

3.0 Zimbabwean Legal Framework

The Zimbabwean legal and policy framework for environmental assessment and management highlights the following points:

a) Environmentally responsible investment and development in Zimbabwe must be encouraged through transparent, predictable, equitable and effective administration of the EIA policy.
b) The long-term ability of natural resources to support human, plant and animal life must be maintained. A broad diversity of plants, animals and ecosystems must be conserved.
c) Natural processes such as the recycling of air, water and soil nutrients must be conserved.
d) Irreversible environmental damage must be avoided and any inevitable environmental damage must be minimized through innovative mitigation.
e) The basic needs of the people affected or likely to be affected by a development proposal, including food, water, shelter, health and sanitation must be met.
f) Social, historical and cultural values of people and their communities must be conserved.

In brief, the purpose of the EIA policy is based on the incorporation of sustainability principles in project planning, evaluation and monitoring. It is also based on the understanding that many decisions concerning the environment are dependent upon meaningful public consultation and that upon being accepted, various government agencies with a mandated interest which include the Environmental Management Agency (EMA), should implement the EIA results on behalf of the Ministry of Environment Water and Climate. EMA is accordingly responsible for the EIA/EMP review, implementation and enforcement. The EIA policy also explicitly pays particular attention to the distribution of project costs and benefits in the spirit that as much as possible, development projects should support local as well as national growth. ***A minimum standard is that local people must be no worse off than they were before a project is implemented.*** It is in this spirit that formal EIA documents should be openly accessible to all stakeholders during the scoping stage.

3.1 Administration of the EIA Policy

The Director-General of EMA has been delegated the responsibility for overseeing the processing of ESIP and ESMP submissions. The Minister is empowered to prescribe any activity, policy or program that in his/her view may cause significant environmental impacts or community disruption. A prescribed activity cannot receive the required authorizations to proceed from the relevant permitting authorities unless, and until, the Ministry has exempted the activity from the requirements of the EIA policy or has granted 'EIA Acceptance'. EIA

acceptance is granted when the Ministry determines that the assessment of an activity has been sufficiently thorough to adequately identify the environmental impacts, which it is likely to cause, as well as measures for managing them. All formal submissions under the EIA Policy are made to the Ministry through the Environmental Management Agency (EMA). Pertinent pieces of legislation include;

3.1.1 Environmental Management Act (20:27)

The Environmental Management Act provides for the sustainable management of natural resources and protection of the environment; the prevention of pollution and environmental degradation. The Act covers Environment Impact Assessment for new projects, standards to be adhered to on emissions, conservation of resources and environmental monitoring. Several aspects of this Act are relevant to the seven water supply upgrade projects. While water abstraction projects are prescribed projects listed in the First Schedule as activities for which environment impact assessment is required, the current projects qualify for exemption on the grounds that they are refurbishment/upgrade projects which occur on converted sites. The Act and Statutory Instruments are based on set principles that serve as guidelines for decision-making on policy implementation and these are summarized as follows;

- the EIA must enhance and not inhibit development by contributing to environmental sustainability and is a means for project planning, not just evaluation,
- the EIA policy depends on the normal regulatory functions of permitting authorities to implement the EIA results,
- the EIA policy involves the participation of all government agencies with a mandated interest in the benefits and cost of a project
- the EIA policy pays particular attention to the distribution of project costs and benefits, and
- identification of project impacts and public consultation is an essential part of the EIA policy

The current subprojects, subject to EMA exemption, will need an ESMP for purposes of managing the few negative impacts as well as boosting the obvious positive impacts.

A number of Statutory Instruments (SIs) have been promulgated in support of the Act as follows;

- Waste and Solid Waste Disposal Regulations – SI 6 of 2007

This SI regulates the disposal of waste (solid waste and effluent). It prohibits any person from disposing waste into a public stream or ground water without a licence. The SI uses the polluter pays principle through licensing which is according to the following classes:

- ***Blue****: in respect of a disposal that is considered to be environmentally safe*

- ***Green****: in respect of disposal that is considered to present a low environmental hazard*
- ***Yellow****: in respect of a disposal which is considered to present a medium environmental hazard, and*
- ***Red****: in respect of a disposal that is considered to present a high environmental hazard*

This means that the waste streams from the project from the planning through construction phase to the operation phase should not be in the red category.

- Environmental Management (EIA and Ecosystem Protection) Regulations - SI 7 of 2007

  The SI deals with regulation of the EIA process and protection of ecosystem. Part II of the Act provides that no project shall be implemented without an EIA having been done. These regulations provide the method of doing the EIA. The developer has to submit a prospectus to EMA who issue a licence if satisfied by the contents of the prospectus. In preparing an EIA, a developer is obliged to consult widely with all stakeholders. The Statutory Instrument prohibits extraction, possession, transportation of sand and clay deposits for commercial purposes without a licence issued by the Agency. The SI also provides for the prevention of veld fires, protection of wetlands and public streams.

This is pertinent for the current project. The proponent will need to ensure that no veld fires are caused by workers at the project site. Licences may be necessary for sand abstraction and transportation, if required.

- Hazardous Substances, Pesticides and Toxic Substances Regulations - SI 12 of 2007.

This instrument prescribes the conditions which have to be observed by employers over the handling of hazardous substances at the workplace, conditions for transporting hazardous substances and procedures to be followed when there is an accidental spillage of the hazardous substances. EMA is empowered to issue spot fines to any person who violates the law. In addition, any person whose substances affect the environment is liable to pay for the cost of restoring the environment i.e. polluter pays principle. The offender is also liable to pay compensation for any damage caused by the offence to any person. The hazardous substances handled during the construction phase of the subprojects include oil and fuel.

- Environmental Management (Atmospheric Pollution Control) Regulations, 2009

The objective of the SI is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. motor vehicles) and stationary sources. It also covers any other air pollution source as may be determined by the Minister in consultation with EMA. Emissions limits for various facilities and vehicular transport have been set. EMA will

issue emission licences for processes that are prescribed under the SI. These licences also embody the "polluter pays" principle. The licences have four bands that is the blue, green, yellow and red. Classification depends on two important variables, the concentration of the emission and the mass flow. Any process which emits emissions above the red class upper threshold value will not be licensed. The emission licences are issued subject to the following conditions; the licence expires on the 31st of December of the year of issue, the licence is not transferable.

The SI will affect emissions from vehicles, generators and pumps/engines as well as dust emissions.

3.1.2 Rural District Councils Act (29:13)

Section 71 (First Schedule) lists the powers of the Rural District Council. Among other things, these include conservation of natural resources, control of bush fires, grazing, animal diseases, sewerage works, pollution, and effluent or refuse selection, collection and disposal etc. In addition to the powers bestowed upon them, Rural District Councils are the Development and Planning authorities within their respective areas of jurisdiction. In this regard, the Act empowers them to plan for the overall development of the Districts.

As development and planning authorities, they are also expected to be aware and guide all development activities carried out by governmental and non-governmental organizations and the private sector within their jurisdiction. Any development that takes place within the Rural District Council's area of jurisdiction should be carried out within the provisions of the council's priorities and approved development plans to allow for coordinated and collective approach to development. RDCs also issue permits for sand abstraction and this project will have to comply with the necessary permits from the RDC.

3.1.3 and Wildlife Act (20:14)

The Act is administered by the Zimbabwe Parks and Wildlife Authority and deals with preservation of plants and animals, including specially protected animals and indigenous plants. Special protected plants may be protected on land for construction purposes and these should be replanted. The construction and development team should not engage into activities which violate this Act. The lists of specially protected animals and indigenous plants are specified in the Sixth and Seventh schedule of this Act respectively. No person shall hunt or pick any specially protected species unless they have a permit to do so.

Section 40 of the Act lays down controls on hunting and removal of animals and plants thereof from national park areas and the sale of products thereof. Any person hunting any animal in a parks area, removing any animal or part of it, or selling any animal, plant or part of it which has been hunted or which has died in or been removed from a park area, in contravention of regulations for the park area shall be guilty of an offence.

3.1.4 Public Health Act (15:09)

This piece of legislation creates the legal framework for the protection of public health in Zimbabwe. Part IX of the Act prohibits the creation of nuisances. Nuisances are defined in this section and local authorities are required to maintain cleanliness and prevent nuisances. Nuisances include premises that promote the spread of infectious diseases, pools of water that may serve as breeding places for mosquitoes, polluted domestic water and accumulation of refuse and any overcrowded dwellings as to be injurious or dangerous to the health of inmates. Relevant to this proposed project is the possible nuisance arising from litter, dust, noise and stagnant pools of water especially during the construction phase.

Under the Act if a person has been served a notice to remove a nuisance and fails to comply, they will be required to face a magistrate and pay a fine for not complying with the requirements of the notice within the specified time period. Nuisances are of importance in all phases of the operations and care should be taken to keep the project sites clean and free of any nuisances.

3.1.5 Forestry Act (19:05)

Section 38 of the Act provides for the preservation and protection of trees or fruit produce. Section 39 provides for the protection of forest or trees from cutting. The proponent should comply with provisions of this Act. The location of the project infrastructure will be in such a way as to minimize the cutting down of trees and protect all endangered species if any are identified within the proposed project site. Construction workers will be discouraged from cutting down trees for fuel/energy.

Section 34, Part 2, of this Act stipulates that the reduction of a national forest by more than 1% will require the written permission from the Minister of Environment.

3.1.6 Water Act (20.24)

Section 101 of the Act contains legislation against pollution of any water and this is also reinforced by regulations from the Environmental Management Act. The discharge of effluent or waste water into any water body will be regulated by permits to which conditions will be attached, subject to prescribed standards and for which fees are payable (see also EMA Act). Permits relating to water abstraction and water storage are granted in accordance with this act. The various waste streams will be subjected to this legislation.

3.1.7 Regional Town and Country Planning Act (29:12)

The Act provides for the planning of regions, districts and at the local level in order to conserve and improve the physical environment. It is also concerned with efficiency and economy as well as providing mechanisms for the control of all developments. Development permits for new projects are granted under this Act. This has since changed and local Authorities can only issue licences to developers after first having sight of the licence from EMA confirming that an approved EIA has been done or an exemption certificate has been issued.

3.1.8 National Museums and Monuments Act (25:11)

The legislation provides for the preservation of ancient, historical and national monuments, relics and other objects or artifacts of historical or scientific value. Section 20(c) requires all commercial developers to carryout archaeological and paleontological impact assessments before any development takes place. Part IV of the Act, Section 21 provides for the notification of discovery of ancient monuments and relics to the National Museum and Monuments. In terms of Section 24, no person shall excavate any ancient monument, and in terms of Section 25, alter, damage or remove from its original site any national monument or relic without the consent of the Executive Director of National Museum and Monuments. It is however important to note that most of proposed site area has already been disturbed. This is also relevant to the 'Physical Cultural Resources' World Bank Environmental and Social Safeguard Policy.

3.1. 9 Road Traffic Act (13:11)

The legislation provides for the promulgation of regulations for the control of traffic movements, traffic noise, fumes, safety and the erection of traffic signs. This is particularly important during the construction phase of the subproject where a lot of material movement will be taking place.

3.1.10 Occupational Health and Safety in the Work Place in Zimbabwe

At a general level, occupational health and safety laws that are applicable to all employers and employees across sectors are the Labour Act, Chapter 28.01 and NSSA (Accident Prevention) (Workers Compensation Scheme) Notice No. 68 of 1990. There are also sectoral occupational health and safety laws.

Environmental Impact Assessment Guidelines

The Environmental Management Agency has established guidelines for Conducting and Reviewing Environmental Impact Assessments. The guidelines explain provisions of the Act in relation to the environmental impact assessment procedure and outline the level of detail required in the environmental baseline study, impact assessment and the environmental management plan. It is within these basic guidelines read together with the relevant World Bank Environmental and Social Safeguard Policies set out below, that the ESMP has been compiled.

3.2 World Bank Environmental and Social Safeguards Policies

The three pillars of World Bank Environmental Strategy are;

- Improving the quality of life
- Improving the quality of growth
- Protecting the quality of the regional and global commons

The objective of the World Bank environmental and social safeguards is to prevent and mitigate undue harm to people and their environment in the development process. The ten thematic areas covered by World Bank environmental and social safeguards are;

- Environmental Assessment
- Natural Habitats
- Pest Management
- Involuntary Resettlement
- Indigenous Peoples
- Forests
- Physical Cultural Resources
- Safety of Dams
- Common Property Resources
- Conflicted Jurisdictions

The World Bank environmental and social safeguards whose applicability will be reviewed below are;

- O.P 4.01 - Environmental Assessment.
- OP 4.04 - Natural Habitats
- OP 4.36 – Forests
- OP 4.11 - Physical Cultural Resources
- OP 4.12 - Involuntary Resettlement

3.2.1 O.P 4.01 Environmental Assessment

The application of the Environmental Assessment safeguards policy aims to ensure the environmental and social soundness and sustainability of the planned water supply subprojects. This policy supports the integration of environmental and social aspects of the seven subprojects into the decision making process, including both the location/site and technology choices, which started with the ZINWA screening reporting. The Environmental Assessment has a two-pronged approach intended to satisfy both the national environmental legislation and the World Bank safeguard policies.

Screening of the seven subprojects at the national level (Environmental Management Act (CAP 20:27) has been initiated through a detailed prospectus submitted to the Environmental Management Agency for review and through which it is hoped that they will exempt the subprojects from full and comprehensive ESIA studies. The Environment Management Act (CAP 20:27) states that 'water abstraction from rivers and reservoirs' is prescribed for full ESIA. Reconciliation of the project scope with this legal requirement gives grounds for exemption consideration. Meanwhile, this Environmental and Social Management Plan has been prepared for the seven subprojects, pending the outcome of the prospectus review process.

3.2.2 OP 4.04 Natural Habitats

This safeguard policy promotes environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The impacts on natural habitats and biodiversity is extremely limited as the water supply projects will be in the form of refurbishment and equipment upgrade, largely taking place within the confines of existing and already converted land uses. Limited new locations/sites will be required for construction of extra water storage facilities and upgrading raw water and treated water mains. The selection of these new sites will be carefully done in order to avoid significant conversion or degradation of critical natural habitats (including those that are protected or designated as having high conservation value).

- The replacement of most raw and clear water mains during the implementation of these subprojects does not involve the clearing of forests as these lines are also already in place and should also not trigger this safeguard policy

3.2.3 OP 4.36 – Forests

Realization of the potential of forests to reduce poverty in a sustainable manner and the protection of vital local and international services and values of forests are key goals of this policy. The restriction of the water supply subprojects to existing sites and infrastructure means that there will be very limited direct degradation or conversion of critical forest areas

or related critical natural habitats as already alluded to. In Zimunya, there may be limited and indirect negative consequences on critical forests as a result of project implementation. There will be adequate mitigation measures laid out in the management plan of this document. The Forestry Act is complimentary to this safeguard policy.

3.2.4 OP 4.11 - Physical Cultural Resources

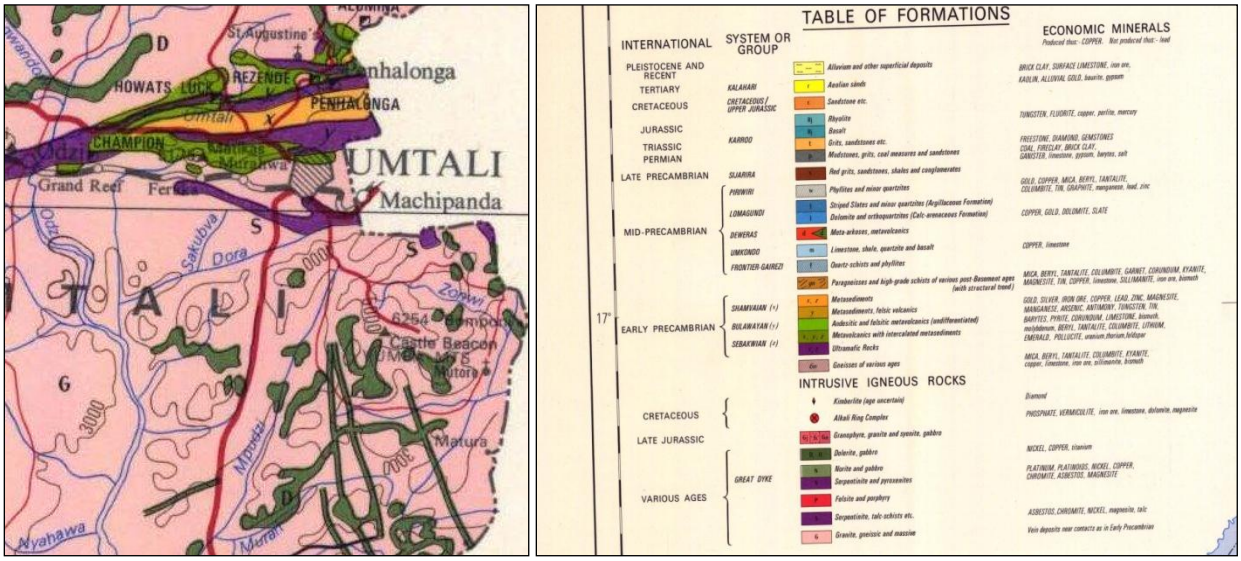
This policy seeks to preserve Physical Cultural Resources and avoiding their damage or destruction. Physical Cultural Resources include resources of archaeological, paleontological, historical, architectural, religious, burial and grave sites and aesthetic structures. Again, the fact that the projects are being implemented in converted land sites means that there will not be any issues of such physical cultural resources needing preservation. The World Bank screening guidelines classify the subprojects into category B, which removes the need for a full ESIA unless specifically required by the national environment legislation. The B category calls for an ESMP and an abbreviated RAP where required.

Chapter 4

4.0 Environment and Social Baseline

4.1 Environmental baseline

4.1.1Geology



The geology around Zimunya is dominated by Proterozoic gneisses and metasediments of Mkondo affinities.

4.1.2 Topography

The terrain around the town is characterized by rolling topography with alternating mountains and valleys. Altitude ranges between 1300 and 1400 meters above sea level.

Figure 1. Zimunya Elevation Profile

4.1.3 Soils

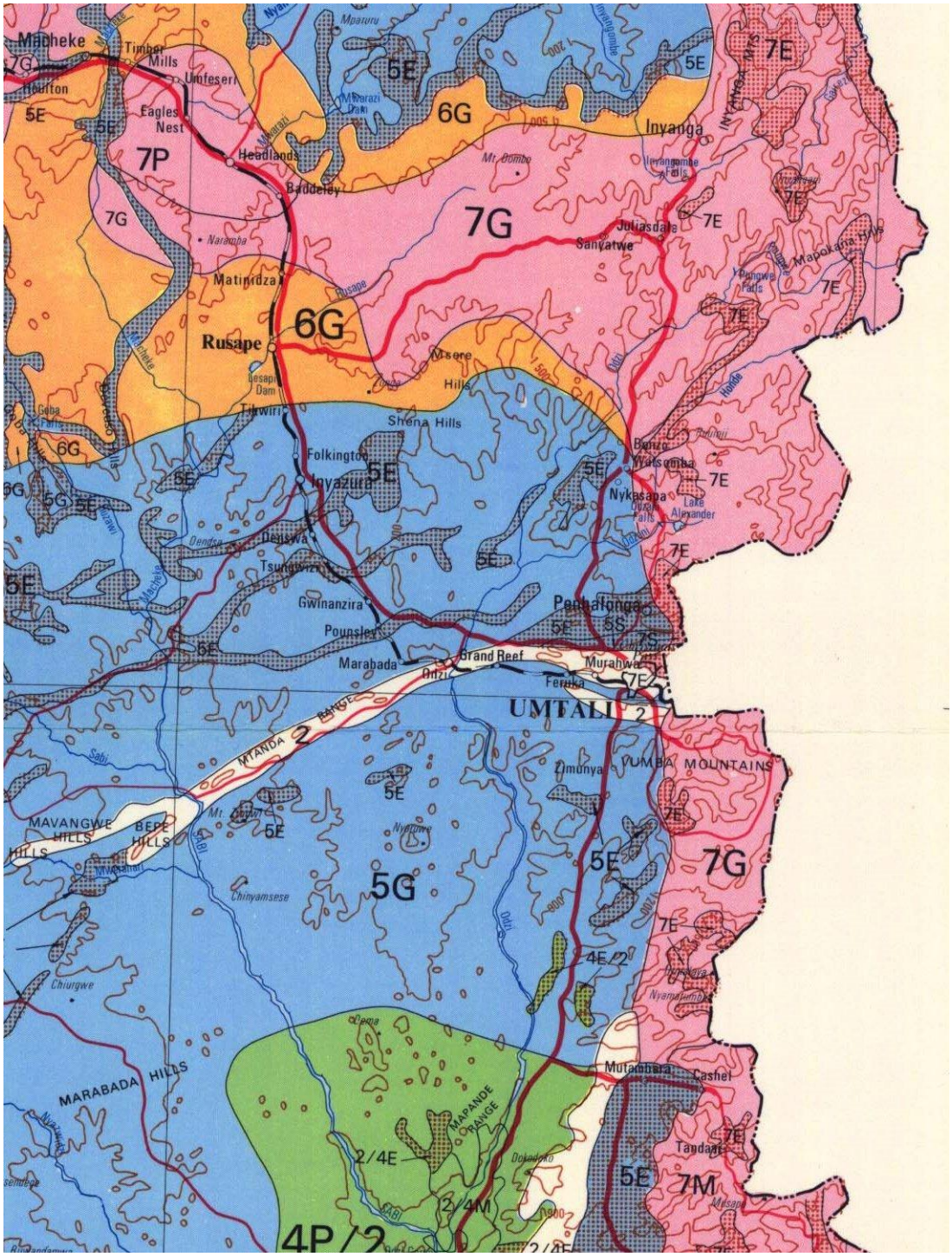


Figure 2. Zimunya Soils Map

The soils in and around Zimunya are largely derived from the Mkondo gneisses and meta-sediments are characteristically grayish sandy loams with moderate cation exchange capacity and therefore of medium fertility. All the land, including the site of works for WTW, clear water mains and storage facilities, belongs to Mutare Rural District Council.

4.1.4 Ecology (Fauna and Flora)

The vegetation consists of Miombo woodland (Brachystegia species) on high and well drained ground while *Terminalia*, *Combretum* and *Acacia* species occupy the low lying areas. Grass species occupy intervening areas.

4.1.5 Climate

Zimunya is located within agro-ecological region II/III which is classified as humid to moderately humid, with moderate to high annual rainfall averaging between 700 to 1050 mm per annum. The typical tropical seasons are divided into winter and summer with winter temperatures ranging between 15 and 20 degrees Celsius and summer temperatures ranging between 23 and 32 degrees Celsius. There are occasional incidences of frost in winter.

4.1.6 Water quality

The raw water supply for Zimunya which comes from the Zimunya dam and Mpudzi Weir, is more than adequate for the growing population of Zimunya and of good quality. Both underground and surface water are of generally good quality. There is bound to be an increase in the amount of energy required for pumping the water up from the ground and into elevated reservoirs. The number of consumers is also set to increase as more water connections are become available.

4.1.7 Hydrogeology

The source of water for Zimunya water supply is Mpudzi dam that has sufficient water for the water supply requirement. Zimunya water supply is the main users as other users are primary. The capacity of Mpudzi dam is 12146ML and currently is 99% full.

4.1.8 Current effluent disposal system

The source of the effluent at the treatment plant is the backwash water that is obtained from cleaning clogged filters. The effluent water is also obtained from disludging settling tanks after accumulation of sediments/sludge. Disludging can be done quarterly depending on the quality of the raw water. The backwash water and sludge is pretreated by directing through banana and sugarcane plantations before directing it in the environment. For compliance parameters such as turbidity, pH, nitrates, phosphates, sulphates, iron, BOD, COD, DO can be tested. Waste and Solid Waste Disposal Regulations – SI 6 of 2007 will be used as a guide. The potential impact

of the project on the quality is that the quality of the effluent will improve and the quantity will increase.

4.2 Socio-Economics

4.2.1 Administrative arrangements

Mutare Rural District is the owner of the land and responsible for waste collection, servicing of stands, monitoring of food hygiene in food outlets and even drinking water supply. The water and sewer systems are run by ZINWA.

4.2.2 Livelihoods

Major livelihoods strategies and occupations in the growth point are formal employment in government and parastatal departments mainly Agriculture, Home Affairs, Education, Health, Youth and Women's Affairs and Environment, Water and Climate, ZINWA, Agritex, CMB, GMB, TelOne, ZESA, Delta and others. General Dealer (hardware and grocery shops), light industry (welding, milling and other food processing industries as well as carpentry). No commercial entities (banks and insurance) were noted. There are a few Mutare RDC workers. The bulk of the population is involved with vending of a variety of goods and wares ranging from fruits and vegetables, grain, clothing and hardware largely in open markets. Average incomes per household are around $50-75 per month.

4.2.3 Population and demographics

Zimunya's current population is 5,615 people based on the 2012 census. The number of households in the area is 1302 and the average size per household is approximately 4.2 persons. There is business centre which consists of various stores, butcheries, beer halls and smaller shops. There are 3 primary schools and a secondary school with over 1500 students. Zimunya has also a clinic with a maternity ward and rural training centre. Construction of residential houses is very active at the present moment and this is an indicator of huge demand for housing and services.

Among the Zimunya's population,700 households are connected to tap waters and about 600 households require connection. Presently residents and institutions connected are receiving water for 2-3hrs per day. Some households in the upper lying areas are not receiving water at all. Those connected in Zimunya include:

Consumers	771
Clinic	1
Schools	4

Institutes	1

Those not connected get water from a borehole fitted with a bush pump. Connected residents also supplement their water requirements from the borehole.

The average payments for water per household for Zimunya are about $15-20. ZINWA is collecting around 80% of revenue per month.

4.2.4 Gender mainstreaming

The project will intend to benefit the girl child in that time taken to source water from boreholes will be reduced. Women roles at household levels are to fetch water and this project will ensure that clean water in sufficient quantities is obtained at all times. School children can also not be late to school after first going to fetch water from the boreholes that are far from their houses.

4.2.5 Land uses

The land use is typically peasant mixed farming with a bias towards cropping. The crops grown are mainly maize with subordinate small grain (millet and sorghum). Most households rear cattle, goats and sheep. Land for all the water projects in Zimunya belongs to Mutare Rural District Council and there is no conflict of uses.

4.2.6 Sanitation Facilities

Zimunya has a dedicated and currently adequate sewage treatment facility. After project implementation, and the expected increase in resident connections, it may become necessary for the center to upgrade its sewage treatment facility as well as connect all the residents to the main sewer system. This will in turn however, have negative consequences of increased malaria due to the new breeding grounds for mosquitoes as well as increased volumes of waste water needing more energy and water treatment chemicals.

4.2.7 Public Health

No cases of water borne disease arising from use of untreated or poor water quality from ZINWA water supply. No untreated water can be distributed to consumers, as this is in contradiction with the Public Health Act. Only treated water is distributed to customers. The government through the Ministry of Health and Child welfare tackles HIV and AIDS issues. National Aids council is also involved in awareness programs..

4.2.8 Occupational health status

Occupational hazards include working on elevated workplaces, handling of chemicals, exposed electrical cables, noise, inadequate lighting and ventilation, chemical dust, un guarded pump sets. The lighting system should be improved to allow workers to perform their duties well. Workers must be provided with the proper and sufficient personal protective clothing. Working areas should have sufficient ventilation and broken window panes should be repaired.

CHAPTER 5

5.0 STAKEHOLDER CONSULTATION

5.1 INTRODUCTION

A stakeholder refers to any person or group who can be affected, is affected by or think that they are affected by or is affected by the results and or actions taken as a result of a developmental process. Environment Management Act (CAP 20:27), section 4 (2c) says that participation of all interested and affected parties in environmental governance must be promoted and all people must be given an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation. As a result ZINWA engaged on a process where these stakeholders participated in the ESMP process by providing needed information which they think will protect them and the host environment and communities. The above process was carried out as a way of ensuring compatibility of the project with other developmental projects already in existence.

5.2 OBJECTIVES OF THE STAKEHOLDER CONSULTATION PROCESS

The stakeholder process aimed at achieving the following objectives;

1. To inform the stakeholders about the proposed project.
2. To identify potential negative and positive environmental impacts associated with the proposed project.
3. To increase public confidence and enhance a sense of ownership in the operational phase of the project.
4. To ensure the negative impacts are mitigated and benefits are maximized.

5.3 PRINCIPLES GOVERNING PUBLIC CONSULTATION

In the spirit of the Environment Management Act, the following principles were consistently upheld in all the consultancy work;

5.3.1 Inclusivity

The public consultation process covered representation of all relevant stakeholders. To ensure this principle was upheld, the stakeholder list was rationalized by the EMA through the prospectus review.

5.3.2 Open and transparent

In order to enhance this principle, the consultant ensured that all consulted stakeholders understood all steps and activities of public consultation.

5.3.3 Relevant

Relevance was also key in this ESMP and was achieved through remaining focused on the project issues that matter. The consultation boundaries also ensured that the consultation process remains relevant to the proposed activities.

5.3.4 Fairness and responsiveness

To achieve the objectives of the stakeholder consultation process there was a need to ensure that the consultation was conducted impartially. All stakeholders were empowered with project information first, and then solicit their informed input.

5.4 DATA COLLECTION TECHNIQUES

It is also important to note that a there is no one best method of data collection hence a number of these methods were employed in the process. The following stakeholder consultation methods were used

- Questionnaire was administered to government departments.
- A public notice was placed in the Manica Post for distant stakeholders who do not necessarily reside in the project areas but are interested or affected by the project.
- Public meetings were held for local communities.

With this diversity, the consultant is confident that all potential stakeholders were reached and their views were correctly captured.

5.5 STAKEHOLDERS' LIST

The following stakeholders were listed for consultation

i. District Administrator.

ii. Ministry of Women Affairs, Gender and Community Development.

iii. Ministry of Health and Child Welfare.

iv. Ministry of Public Works.

v. Local Authority

vi. Ministry of education (schools)

vii. ZRP.

viii. Local Community groups (Women groups, youth groups, old aged group where applicable).

ix. Ward Councilors.

x. Local Village Head.

xi. Local Chief

xii. Local NGO community

5.6 SUMMARY OF STAKEHOLDER INPUTS

5.6 Summary of stakeholder inputs

Name of stakeholder	Date	Venue	Mode of Information Dissemination	Stakeholder concern/ in put	Response
1. Mutare RDC , ZINWA and Environment consultant– World Bank	11/6/15	Mutare RDC-CEO office	Meeting	Mutare RDC concerned about adequacy of raw water source. World bank consultant was concerned about any relocation of residents. World Bank was concerned on the issue of sewage waste after expansion. Mutare RDC reiterated that although ZINWA is responsible for water and sewer services they sometimes respond to customer complaints on ZINWA fixed charges. Mutare RDC said they were planning to have residential expansions and asked ZINWA if they had adequate water to service those areas as it was the government's directive to sell well serviced stands with both water and sewer systems.	ZINWA Zimunya litres) wa the raw w ZINWA was no rehabilitat the proj existing li encroachm reserves network. Mutare R design la ponds and the sewag could su volume o the sewag sustain th of efflue could b mitigation ZINWA arrangeme as it Muradzik receive w borehole

					centre.
2. RDC Engineer	4/6/15	Mutare RDC-Engineers office-Mutare Central Business District	Questionnaire	Residents resort to unprotected shallow wells and Open defecation due to inadequate water supply potential for diseases outbreaks. Supply not enough as the township has grown beyond the originally designed capacity. Storage can no longer meet the minimum 48 hour supply without pumping. Trunk main also too small. Frequent sewer blockages	Upgrade and rehal meet mi supply wi Rehabilita reservoirs Duplicate replace w Close liai RDC s expansion in the des system Resuscita which hav halt due t water sho
3. DA	8/6/15	DA Office-Mutare Central Business District	Questionnaire	Erratic water supply Water bursts Water supply inadequate due to population growth. Residents cannot embark on income generating projects which are water related such as horticulture. Residents drinking unsafe water from shallow dug wells Sewer blockages Trenching can pose a threat to residents if allowed to take so long before covering them	Power generators Attend timeously Repair reservoirs Upgrade w Upgrade Employ lo

				up. The area can become a hub of HIV and Aids due to introduction of new people in the area with different cultural and moral values. Drug abuse	HIV and
4. Local chief	5/6/15	Mafuke Head homestead-Zimunya Township	Questionnaire	Do not have source of clean water. Potential Increase in prostitution hence in increase chances of spreading HIV and Aids due to newcomers in the area. The few people with tapped water are affected by power outages. Potential increase in drug abuse that can lead to domestic violence.	New conn Employ l sustain reducing Awarenes access to
5. Nurse in-charge Zimunya clinic	8/6/15	Zimunya Clinic-Zimunya Township	Questionnaire	Shortage of water because the township has developed. Potential for communicable disease such as diarrhea spreading due to increase in population. Potential for spreading of sexually transmitted diseases such as HIV. Potential for spreading for infectious diseases such as TB due to overcrowding.	Health in toilets Health e condoms. Health e washing a hot Educate overcrow

6. Member in charge – Zimunya police station	8/6/15	ZRP Zimunya Post-Zimunya Township	Questionnaire	Water supply erratic and not constant. New project has potential to cause increase in crime due to disposable income. Such crimes include prostitution, rape and child abuse.	Police pr areas. Carrying campaign
7. Rowa Institute of Training and Development	8/6/15	Rowa Institute of Training and Developme nt	Questionnaire	Resuscitation of ZINWA borehole located at the institute has improved current clear water supply Challenges of not constant supply. Security of project water pipes against vandalism. Illegal siphoning of water from reticulation. Erosion due to burst pipes Loss of vegetation	Need ins valve. Installatio at the inst Power bac Guard aga
8. Muradzikwa Primary school	8/6/15	Headmaster s office – Zimunya Township	Questionnaire	Erratic water supply and inadequate for student population Power outages Inefficient storage tanks at school to support extensive agriculture to b examinable by ZIMSEC at grade 7 with effect from 2017.	Power generators Increase v school.

9. Dangare primary school	5/6/15	Deputy Headmaster office-Zimunya Township	Questionnaire	Erratic supply in the township thus affecting the livelihoods of their children.	Need to reservoirs
10. Zimunya Secondary school	8/6/15	Headmasters office-Zimunya Township	Questionnaire	Clear water shortages affecting health and sanitation.	Power generators Upgrading water reti Building
11. Zimunya Primary school	8/6/15	Headmasters office-Zimunya Township	Questionnaire	Erratic water supply such as three times a week.	Upgrade s
12. Ministry of Health and Child Welfare District Environmental Health Officer (Mutare District)	24/6/15	District Environmental Health Officers office-Mutare Provincial Hospital	Questionnaire	Shortage of water when there is a breakdown Population is increasing so that supply will be out stripped. Zimunya experienced cholera outbreaks in 2008 and 2011 People drink water from unprotected sources when there is shortage of treated water. Breaking water pipes and sewer contaminate environment.	Leaking these m outbreaks Sewer pip to accor population
13. Ministry of Women Affairs, Gender and Community	11/6/15	Office-Zimunya Township	Questionnaire	Inadequate water supply Poor water quality (rust and particles) that might diseases to residents.	Provision reservoirs availabilit water rati Upgrading

Development.					of water r
14. Ministry of Youth	17/6/15	Office- Zimunya Township	Questionnaire	Erratic water supply No timetable for water rationing and some sections of Zimunya do not receive water for days and sometimes weeks. Diseases caused by lack of water for sanitation	Want rel system. Water s during the Need mor sections o Old wat replaced Install mo Employ rehabilitat through w
15. Ministry of Small and Medium Enterprise and Cooperative Development (MSMECD)	9/6/15	Office- Zimunya Townships	Questionnaire	Water supply not pleasing. Sometimes there is no tapped water supply. Sometimes there is dirty clogged with impurities.	Project sh to the natu Damage water minimize Household not be threatenin of the pro Local co consulted project. EMA sho the be practices.
16. All Saints Anglican Church	14/6/15	All Saint church- Zimunya Township	Questionnaire	Shortage of water Diarrheal diseases such as dysentery, typhoid	Upgrading Creation to Zimuny who are

				unemployment	township preferenc Zimunya
17. ZAOGA FIF Church	14/6/15	ZAOGA FIF Church-Zimunya Township	Questionnaire	Erratic water supply affecting conferences. Sometimes get water that is not clean (rusty and sometimes untreated).	Provision avoid dise and chole To have allow sm run. Replace new ones. Installatio of new ta the grow communit Give firs youths and upgra
18. Hilltop Tabernacle	14/6/15	Hilltop Tabernacle church-Zimunya Township	Questionnaire	Erratic water supply sometimes once after two weeks or during midnight. Water shortages affecting gardening, use of toilets. Water shortages affecting income generating projects such as rearing broilers and layers. Alternative source of clean water for drinking and for chickens are scattered boreholes where people are facing problems of spending their important time in queues that causes people to make a lot of noise and troubles	Provision backup (g continuou water.

				(gossiping).	
19. Women's groups	16/6/15	Zimunya Township	Questionnaire	Supply of water is not constant and can even go for two or three weeks without water. Water comes towards month end when we about to pay. Sometimes water comes with a pungent smell and rusty. Water has no pressure to reach their kitchens and bathrooms. Water not sufficient because Zimunya is growing but water treatment plant is not expanding. Water sometimes have rusty due to old pipes. Women are spending useful time at boreholes. Long queues at boreholes causing women end up fighting for water. Sometimes women end up fetching water from unprotected sources such as streams. Diseases can be caused by drinking dirty water from unprotected water sources. Erratic water supply and sometimes comes once per week.	Provide water. Complete Water sho Water recommer it reaches Project ca to the communit Replacing new ones. Adding m Provision adequate

				Water shortages causing women spending the whole day at the boreholes or fetching water from unprotected sources hence exposing women and their families to diseases. Gender balance when comes to employment. Erratic water supply and sometimes comes once per week. Pipes are old comes out rusty in water. Water comes without pressure thus not able to come out in toilets. Women spending useful time fetching water from boreholes and streams. Women wait long hours in queues and this sometimes causes fights. Unemployment of youth and some able bodied.	Improve v Pipe ove water qua Treat wat To have that repre The pr employm Zimunya **boy child** Replacing upgrading plant will fetching v and strea Employ l that are rehabilita Zimunya Addition Zimunya water eve
20. Residents	17/6/15	Zimunya Township-residence	Questionnaire	No water supply in new developed area (New Canaan). Fetching water from unprotected wells thereby exposing residents to waterborne diseases. Unavailability of water for sanitation hence resorting to	Connectio supply sy

				blair toilets. Do not receive water when there is load shedding. Fetches water from boreholes if there is no electricity. Fixed charge too much Project can cause HIV/Aids prevalence	Provision (reservoir continuou even if th Reduce fi HIV an campaign
21. Business people	8/6/15	Zimunya Township	Questionnaire	Water scarcity	By meetin
22. Ward 32 Councillor	9/6/15	Zimunya Township-residence	Questionnaire	A very critical situation which needs addressing	Act as s help impr

1.7 LOCAL COMMUNITY AND LEADERSS

The approach adopted for the consultations for Zimunya included interviews, questionnaires and meetings. Interviews were conducted with households. The purpose of the interviews was to gauge the perceptions of residents about the service they were getting and how it was impacting on them. The interviews also sort to find out the ability of the residents to pay for water services. Meetings were convened with rural district council officials, ZINWA officials, officials and business people.

1.8 Mutare RDC

The RDC indicated that it is interested in running water services for Zimunya. In the past they failed because there was a gap between water treated by council and what was ultimately sold to the residents. This resulted in huge losses for council.

Council also felt that residents needed to be concentised on the need to pay their bills and not vanadalize water meters.

The issue of monitoring the quality of water being produced by the treatment works was important. Council should equipment to be able to monitor the quality. Water was a priority issue for council.

1.9 ZINWA

ZINWA indicated that they had 771 registered consumers in Zimunya. There are about 300 consumers who are not connected. Zimunya gets water for 2-4 hours per day. There is an additional DDF borehole in Zimunya to argument water supplies. There are other centres like Rowa across the Masvingo road which also need to be connected. There are some illegal connections.

Collection rate for water consumption is about 80%.

Some houses that are not connected use wells and at the same time they have pit latrines and this increases the risk of contamination of ground water. The councilor for Zimunya is the Water Committee Chairman and liaises with ZINWA on water development issues.

1.10 Business community

Issues raised on behalf of the business community are similar to those raised in other centres. These include:

- Slowing down construction
- Some businesses have closed down because of the problem of water.
- Others have relocated to Mutare

1.11 Residents

5.11.1 *Availability of water*

Water is available to residents on average for 2 to 4 hours per day. Houses on high ground are affected as they will not get water. They supplement using boreholes or shallow wells. Water pipe bursts are also frequent in some new residential areas. The pipes were buried very close to the ground and pipes burst when cars move over.

5.11.2 Time/Distances to water sources

Unconnected households expressed concern over the distances they have to travel and the time spent fetching water. There is only one borehole. On average those who are not connected have to walk for up to 30-45 minutes one way to the borehole. This is compounded by the fact that they have to carry 20 litre containers to fetch water in hilly terrain. These water trips are made 2-3 times per day. Residents indicated that these trips take up a lot of their time and compromises other household chores like cleaning the house and preparing food for children.

5.11.3Costs of water

There is a general willingness to pay for water. Households who are not yet connected indicated that they are willing to pay $15-20 per month towards water charges. Those who

are currently connected are paying an average of $15 per month for consumed water. The unconnected residents sometimes have to rely on water vendors who charge around $5 per 200 litre drum. Others rely on the one borehole. Some fetch water from open wells for free from philanthropists.

5.11.4 Hygiene issues

All the households interviewed and the RDC voiced their concern regarding the issue of hygiene. The lack of water has resulted in households resorting to using pit toilets. This has created pollution of ground water. Blair toilets have been constructed on some very small 200-300m^2 plots. Some of these plots also have shallow wells and there is a very high risk of the toilets contaminating the wells.

Households also indicated that the improvement of the availability of water for households currently receiving water for limited periods and the connection of those who are not yet connected will result in a huge improvement in their domestic hygiene as they will be able to do their laundry more frequently and regularly. They would also be able to improve on domestic activities requiring more clean water like washing of plates and bathing.

5.11.5 Speed up Construction

Households who were constructing their houses indicated the difficulties imposed by the lack of water on construction progress. Construction of houses in the new areas has slowed down. Those constructing houses have to pay vendors to ferry water from the borehole to their stands. The plot owners pay $5 for a 200 litre drum of water. This makes the construction process expensive and slow.

5.11.6 Income Generating Activities

All the households indicated that they will embark on income generating projects like poultry and vegetable growing if water is available. They indicated that under the current economic situation it would be desirable to have a project that gives them an income, even just a vegetable garden. However, this is difficult without water close by. The introduction of reticulated water will enable the households to engage in these activities.

5.12 LOCAL NGOS AND OTHERS

National Aids council was involved in educational awareness and distribution of condoms (female and male)

CHAPTER 6

6.0 IMPACT ANALYSIS AND EVALUATION

6.1 Introduction

The main objective of this ESMP is to promote sustainable development by ensuring that the water supply project does not undermine critical resource and ecological functions or the well-being, lifestyle and livelihood of the communities and peoples who depend on them. As a decision making tool, the assessment sought to inform the decision making process by identifying the potentially significant environmental effects and risks of the proposed project activities, assessing them, evaluating the possibility of alternatives and proposing the mitigation measures of any significant negative impacts through an environmental management plan.

Only those elements of the environment that have a direct bearing on the impact assessment process of the project are discussed. The severity of the potential impacts is largely determined by the state of the receiving environment. For example, the construction of a water pipeline in a pristine wetland habitat would have far more significant ecological impacts than the construction of the same in an already built up residential area.

6.2 General Approach

Table 3.1 was used principally during impact identification and analysis. The type/status (positive, negative, neutral), magnitude/Significance, timing (during design / planning, construction, and operation), duration (short term/temporary, medium, long term/permanent), extend/spatial scale (low, medium, high), mitigatory potential (low, medium, high), acceptability (low, medium, high) and degree of certainty (definite, probable, possible & unsure), of impacts that could result from the water supply were assessed in this section. The evaluation approach implemented in this study is a Receptor-Specific Analysis approach addressing the various sources of impacts from the development project. The analysis covers all potential fields of impacts and/ potential receptors:

- Ambient Air Quality
- Water resources
- Soil
- Biodiversity
- Noise
- Dust

- Waste generation
- Socio-economic Impacts
- Occupational health and safety

The general evaluation process included the following stages:

Step 1: Identification of project activities (sources) and environmental aspects;

Step 2: Identification of potential impacts to people and the environment;

Step 3: Evaluation and assessment of the related unmitigated impact significance;

Step 4: Identification of Best Practicable Environmental Options

Step 5: Re-evaluation and assessment of the mitigated impact significance

Table 3.1: Criteria Used For Assessment of Impacts

ASSESSMENT CRITERIA	RATING	INTERPRETATION OF RATING
TYPE/STATUS	Negative	Process detrimental/adverse to environment
	Positive	Process beneficial to environment
	Neutral	Process neither beneficial nor detrimental
MAGNITUDE OR SINIFICANCE	High(Red)	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impact there is no feasible mitigation that could offset the impact, or mitigation is difficult, expensive or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of substantial order within the bounds of impacts that could occur.
	Moderate (yellow)	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of impacts that could occur. In the case of adverse impact mitigation is feasible and fairly easily achievable. Social, cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the process design or alternative action may be required. In the case of beneficial impacts, other means of achieving this benefit are equal in time, cost and effort.

ASSESSMENT CRITERIA	RATING	INTERPRETATION OF RATING
	Low (Green)	Impact is of low order and therefore not likely to have real effect. In the case of adverse impact mitigation is easily achievable, or little will be required. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time consuming.
EXTENT OR SPATIAL SCALE	High	Widespread, far beyond site boundary, Regional/National/ International Scale
	Medium	Beyond site boundary, local area
	Low	Within site boundary
DURATION	Long	Permanent, beyond decommissioning
	Medium	Reversible over time, lasts for lifespan of project
	Short	Quickly reversible, less than lifespan of project
MITIGATORY POTENTIAL	High	High potential to mitigate impacts to the level of insignificant effect
	Medium	Potential to mitigate negative impacts. However, the implementation of mitigation measures may still not prevent negative impacts
	Low	Little or no measures to mitigate negative impacts
ACCEPTABILITY	High	Unacceptable. Abandon project/process in part or in its entirety

ASSESSMENT CRITERIA	RATING	INTERPRETATION OF RATING
	Medium	Acceptable with regulatory controls and with proponent's commitments
	Low	Acceptable, no risk to public health
DEGREE OF CERTAINTY	Definite	More than 90% sure of a particular fact or the likelihood of an impact occurring
	Probable	Over 70% sure of a particular fact or the likelihood of an impact occurring
	Possible	Only over 40% sure of a particular fact or the likelihood of an impact occurring
	Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring

6.3 Main Impacts and Mitigation for Zimunya

Remember the following impacts where applicable;

1. Water pollution from backwash effluent
2. OSH
3. Staff accommodation
4. Water quality management
5. legal compliance and reporting
6. Gender mainstreaming

Citizen engagement and feedback

6.4 Impact Analysis for Zimunya

Besides the trenching for reticulation for houses not connected, all activities for Zimunya project will take place within the existing water works.

6.5 Planning Phase

Some planning activities for the project have already taken place and hence some of the impacts under this phase have already been felt.. The refurbishment/construction of the main water treatment plants in Zimunya is the main activity. This would target upgrading of pumps, engines and accessories such as gauges, meters, valves etc. With the rapid growth of Zimunya, there would also be a need for larger storage tanks complementing a wider clear water mains. The planning phase normally involves the cutting of trace lines for land surveys and pegging. Impacts normally result from cutting down vegetation, disturbance to soils and dragging of equipment on the ground.

6.6 Biophysical

6.6.1 Vegetation

This impact has already been felt in Zimunya for all intents and purposes as ZINWA compiled the needs assessments and engineering specifications reports. Besides, most of the project area is already built up. It is only in the areas where pipe rehabilitation or construction where careful planning is required as there may be a bit of secondary vegetation. Even the site for the clear water storage tank in Zimuny has been cleared of vegetation and the site is almost ready for

construction activities. The other areas for reticulation are devoid of vegetation as these are in the built up residential, commercial, industrial or institutional spaces.

Assessment for vegetation impacts during planning phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

This is judged to be an impact of low significance because over 90% of the project area has no vegetation as the areas have been built up.

Mitigation

Avoid disturbing or cutting trees in areas where there is still some vegetation. Surveys and pegging will only utilize spatially limited areas and this is not expected to be a significant impact.

6.6.2 Wildlife

The project area in Zimunya and its surrounding areas has no significant wildlife because of its built up nature and the surrounding rural communities. There are however some small mammals such as bush bucks and hares in the area which is fairly rugged.Most of the planning activities have already taken place.

Assessment for impacts on wildlife during planning phase

Assessment Criteria	Rating
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

This is an impact of low significance because of the low existence of wildlife and short duration of activities.

6.7 Soil impacts

Movement and dragging of equipment on the ground during the time of survey and pegging of lines to be excavated for the pipes to be buried can result in loosening of soil which can potentially result in soil erosion or the generation of dust. However, this is not deemed a significant impact as the pegging and surveying activities are very low key.

Assessment for soils during planning phase

Assessment Criteria	Rating
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

This is an impact of low significance due to short duration and much localized nature of activities.

The best mitigation measure would be to avoid dragging equipment on the ground and to ensure that there is no loose soil that can be blown away by wind or is washed away by water.

6.8 Hydrological and fluvial impacts

The effects of sheet erosion on loose soil if left unattended could trigger a host of negative impacts on water quality, levels and the capacity of water bodies. The negative impacts will accrue from siltation as valuable topsoil finds its way into streams.

Assessment for hydrological impacts during planning phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

The impact is of low significance.

The best mitigation measures here would be the one described above for soil.

6.8.1 Soil Disturbance

The trenching for the laying of the water reticulation pipes and the rehabilitation of the existing main pipeline to the water tanks will result in the disturbance of the soil. Trenches will be dug to lay pipes whilst the rehabilitation works will require trenching to lay bigger pipes. This is a temporary impact which will only be felt during the time of digging and laying of pipes.

Assessment for soil disturbance during construction phase

Assessment Criteria	Rating
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Medium
Degree of certainty	Definite
Significance before mitigation	Moderate
Significance after mitigation	Low

This impact will definitely occur during trenching and other earth works but its duration is limited to the construction phase only and can be attended to immediately. The spatial scale is very limited and the impact can easily be mitigated.

The soil will be used to cover the pipes once the laying process has been completed. It is recommended that this is done immediately to avoid having mounds of soils lying around.

6.8.2 Dust

A bit of dust will be generated during the trenching and covering up of pipes. This will be a temporary impact which will last during the trenching and covering up of pipes. It is recommended that wherever possible loose soils are sprinkled with water to avoid the creation of dust. In any case the trenches will be shallow; at most they will be about 0.5m deep.

This means that the pipes will have to be laid at least 0.75-1m deep. The disturbed soil during excavation can easily be washed away by water if left unattended for long periods.

Assessment for dust generation during construction phase

Assessment Criteria	Rating
Type/status	Negative

Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Medium
Degree of certainty	Definite
Significance before mitigation	Moderate
Significance after mitigation	Low

This is similar to the above impact on soil disturbance.

It is therefore recommended that pipes be covered as quickly as possible to avoid the soil being washed away. Back filling of the pipes should take place within a day or two to reduce dust from the loose soils from the trenches. This will also forestall dust generation from soil piles left unattended for long periods.

6.8.3 Disturbance of Forests and Biodiversity

The areas to be connected have already been transformed into built up areas. There is very little vegetation and wildlife. As a result, the impact of the project on vegetation and wildlife will be very limited to nothing. The construction site for storage tanks has already been cleared of a few teak trees. The refurbishment/construction of the Zimunya water supply system will therefore not cause any direct disturbance of the forest area.

Assessment for biodiversity during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Medium
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

6.9 Operation Phase

Biophysical impacts of the operation phase of Zimunya water supply system are very limited in contrast with socio economic impacts. Some of the predicted impacts include possible contamination of treated water from back washing of filters.Increased volumes of treated water passing through the filter will entail more frequent backwashing and possible scouring to flush out rapidly accumulating debris and particles and regain the filter head pressure loss. Backwash water is very dirty and there is always a need to have a dedicated backwash line, complete with backflow prevention (Zane, 2005). This is either linked to a sewer main or a series of settling ponds, from which the overflow portion can be decanted into a nearby river while the dirt collects at the bottom. Backwash can also be recycled where water scarcity demands it. When the settling ponds are full, they can be covered up with soil and re-vegetated/reclaimed.

Other generic biophysical impacts will result from knock-on effects of increased water abstraction, increased wastewater production, increased numbers of residents and private vehicles. Increased water abstraction from the raw water sources in Zimunya, may result in interference with some aquatic habitats, reduced water supply to some downstream wetlands and water pools with effects on habitats and biodiversity. Analysis of these impacts would require a more detailed study in a full ESIA. Increased wastewater production is a natural consequence of improved water supply and this will strain the sewer treatment plants for the project with common sewer line bursts resulting in malodorous releases and vector-borne transfers. Increasing resident populations come with increased solid waste generation and vehicular exhaust and noise pollution.

Assessment for impacts during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Long
Mitigatory potential	High
Acceptability	Medium
Degree of certainty	Definite
Significance before mitigation	Moderate
Significance after mitigation	Low

6.10 Social Impacts

6.11 Planning Phase

This phase will involve the surveying and pegging of pipeline routes for reticulating houses in the residential areas. Due to its limited duration and numbers involved the social impacts associated with this phase are limited. These largely relate to employment for one or two people. In order to enhance this impact, it is recommended that local youths from Zimunya be employed.

Assessment for job creation during planning phase

Assessment Criteria	**Rating**
Type/status	Positive
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Definite
Significance before mitigation	Low
Significance after mitigation	Low

This is a low significance impact on account of the numbers involved and the duration and spatial extend which are very limited.

6.12 Construction Phase

These will be related largely to the trenching and laying of water pipes in the residential area.

6.12.1 Employment

The major benefits arising from the act of construction are four fold, namely,

- Employment creation through recruitment of unskilled and semi-skilled labour for trenching and assisting in the construction of water and storage tanks.
- Creation of and increase in incomes from the new jobs.
- Improvement in standard of living arising from the afore-mentioned increase in disposable income.

- Boosting of existing businesses and creation of new businesses as commercial enterprises benefit from or capitalise on increased purchases generated by increased disposable incomes.

Assessment for job creation during construction phase

Assessment Criteria	**Rating**
Type/status	Positive
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Definite
Significance before mitigation	Low
Significance after mitigation	Low

The impacts originate from actual construction of the digging and the laying of reticulation pipes plus related tasks such as excavation, clerical work, blasting and security. Most of the impacts are mostly of moderate significance.

6.12.2 Enhancing Impact

The actual benefits to the local communities in Zimunya will depend on the way the proponents and stakeholders behave and/or make decisions regarding implementation logistics. Positive discrimination in the handling of access to benefits will have to be exercised. This means that locals, particularly those from Zimunya centre will need to be favoured over outsiders in both the allocation of contracts, business licences and the determination of employment quotas.

The use of local labour for non-skilled and semi-skilled work will have to be written into the tender documents and subsequently used as one of the main scoring criteria for the technical bids by prospective contractors. Having a deliberate bias towards the adoption of labour intensive methods as opposed to capital-intensive methods of construction could widen the labour pool. The level and spread of incomes will be ensured by making sure that respective contractors pay at least the minimum wages for the respective industry as agreed between employer representatives and unions, chief of which are the Construction and Allied Workers Union and the Employers' Confederation of Zimbabwe (EMCOZ).

6.12.3 Health and Promiscuity

The negative impacts arising from these activities are of low to moderate significance. Some will last well into the operation phase while others are permanent. By far the majority of these impacts are of a socio-economic and political nature. Among the principal ones are:

- Increase in prostitution, promiscuity and immorality as gangs of 'liquid' male workers – single or married – seek 'entertainment' and enjoyment.
- Break up of the social fabric caused by local males who are led astray by increased incomes and engage in adultery or bouts of drunkenness, or local females who fall for the 'moneyed' local or outside males working on the factory site.
- Increase in Sexually Transmitted Diseases including HIV/AIDS due to increased prostitution and promiscuity.

Assessment for promiscuity, health during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

This is a low significant impact because of the duration and spatial extend.

MITIGATION

In general the measures include a mixture of moral suasion, preventative strategies, education and legalities. Education, counselling and a penal code will address the health and moral problems. Education on HIV/AIDS as well as a proactive preventive approach like that used by community health workers will reduce the unfettered spread of STDs, including HIV/AIDS. A penal code on errant workers and household heads, as well as drunkards and those proven to be

having a hand in breaking up families may need to be worked out in consultation with legal personnel. Making all workers contract workers for a set period will make it easy to get rid of undesirable elements in the workforce.

Prior agreements on quotas, independent monitoring and the recruitment of local labour and installation of own facilities or assistance towards provision of facilities by contractors can deal with resentment, animosity and friction and allay fears of possible sabotage as locals see the project as one big inconvenience with little or no benefits.

6.12.4 Safety

Issues of safety – both for workers and residents are important. Worker safety is guaranteed under the laws of Zimbabwe. Those employed during the construction period should be protected from injury. There is potential for employees to be injured as they dig trenches or work on water pipes. They can injure their hands, eyes or other parts of their bodies.

On the other hand, trenches left uncovered can result in injuries to residents. Children can be vulnerable as they see mounds of loose soil as a potential source of entertainment to play with.

Assessment for safety during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

This is a low to moderate significance impact because of the low numbers of people involved and the probability of accidents happening from the low key activities.

Mitigation

The project shall have an approved SHE plan. Workers should be given adequate protective clothing as per the laws of the land. This will depend on which department they will be working under. They will need overalls, heavy duty boots and noise protection kits if they are working in noisy areas.

For the residents, it has already been highlighted that the soils will need to be backfilled as quickly as possible. All open trenches should be barricaded using safety reflective tape. The open trenches should not be left open for more than 2 days. They should be backfilled immediately. This will forestall the possibility of injuries resulting from people falling into the trenches or injuries to children playing on soil mounds.

6.12.5 Waste Generation

The labour that will be recruited to do the construction work have to dispose of human and other material waste somewhere. There will be off-cuts of pipes and wrapping materials which will need to be disposed off. The logic of labour efficiency will dictate that while they are at work they will opt to dispose of this waste as near to the workstation as possible. Left uncontrolled, this phenomenon will result in litter and excrement dotted all over the proposed development site.

Assessment for waste during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

This is an impact of moderate significance on account of the unacceptability of the impact. However, the impact can be easily mitigated.

Mitigation

We recommend a careful planning of waste-disposal during the construction phase. For papers, food leftovers and similar rubbish we propose a well-organise garbage collection and disposal system. This will need the provision of bins, the raising of awareness on indiscriminate dumping by the workforce, and the careful disposal of the rubbish out of site and in a safe place that will not be accessed by scavengers.

For human waste we propose the provision of temporary ventilated pit latrines. These should be set up in such a way that they are spaced across the work area, away from water sources and sacred sites. After the part of the work is done, they can easily be collapsed and covered over gain in a way that will not make it easy for scavengers to access the sites. No 'ruins' should be allowed to remain after the work. Black plastic sheeting is a possible construction material.

6.12.6 Traffic

Movement of construction vehicles bringing in pipes and other supplies has the potential to increase traffic conflict with local traffic and also cause accidents with domesticated animals. Whilst this impact is temporary as it will be felt largely during the construction phase, it is potentially significant as it may result in fatalities through accidents. However, construction vehicles will move outside the project area only when they are bringing in supplies and this will limit the conflict with outside traffic to those times only. Traffic will also increase dust in the area.

Assessment for traffic during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Short
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Low
Significance after mitigation	Low

This is an impact of low significance as the vehicles are expected once in a while hence the limited duration of the impact.

Vehicles bringing in supplies to the project should not travel at more than 40 kilometres per hour. This will not only ensure that traffic accidents are kept to a minimum, but will also limit the amount of dust generated.

6.12.7 Disturbance of cultural resources

Since the project is taking in a residential area that is built up, chances of encountering anything of cultural significance are almost nil. The probability of this happening is very low and hence the impact is viewed to be of low significance. If these existed, they could have been disturbed by construction of houses and other buildings. So whilst the Bank's policy on cultural resources (OP 411 Physical Cultural Resources) states that projects avoid these, the investigation did not come across any such resources.

Assessment for cultural resources during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Long
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

It is recommended that should any such resources be encountered, they be reported to the team leader who should report these to the department of National Museums and National Monuments. Laying of pipes should also avoid resources like medicinal trees.

6.12.8 Disturbance to other services

The project will involve digging trenches for laying water pipes. It is possible that in some of these areas there could be other buried services like PTC cables, ZESA lines and sewer lines. Reckless digging may end up severing these services which may be buried under ground

resulting serious disruption. This is potentially an impact of moderate significance given its probability of occurrence and the easy with which such an impact can be mitigated.

Assessment for disturbance of other buried services during construction phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Low to medium
Mitigatory potential	High
Acceptability	High
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

Such an impact can be mitigated by liaising with the relevant authorities like ZESA, PTC and council sewer services to get maps of any buries services and determine where they run. This should be done prior to trenching activities in any area.

6.13 Socio-economic impacts: Operation Phase

This is the phase with the most durable impacts. Most of the impacts related to this phase will last as long the completed projects are in existence. Some are direct while a significant proportion.

6.14 Positive Impacts

The activities that will generate positive impacts include:

- Investment in the centres
- Employment creation in provision, operations and maintenance. ZINWA/RDCs will need more people to maintain their system
- Increased disposable incomes due to increased availability of paid jobs.
- Increase in local authority/ZINWA income through rates, rents and user charges
- Development of ancillary activities for production and services upstream and downstream.

- Improvement in hygiene and health
- Income generating activities at household level

6.14.1 Employment creation

There is a possibility that ZINWA may employ more people for maintenance. This will boost local economic development. There is the chance that the revenue collection base for ZINWA will increase and this will boost their incomes. This is an impact of moderate significance.

Assessment for employment creation during operation phase

Assessment Criteria	**Rating**
Type/status	Positive
Extent or spatial scale	Medium
Duration	Long
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

6.14.2 Improvement in Hygiene

Hygiene and health of households will generally improve with more water being available for domestic use. Households will be able to use flush toilet. This will reduce the current practice of using the bush as toilets. This will in turn reduce the risks of contamination arising from this practice. Households will also be able to use clean water for washing clothes plates and engage in other household chores requiring more water. Some households also have pit latrines on their small 200-300m^2 plots. Some of these also have shall wells and there is a huge risk of contamination of the wells by the pit latrines resulting in outbreaks of diseases like cholera and typhoid.

Assessment for hygiene during operation phase

Assessment Criteria	**Rating**
Type/status	Positive

Extent or spatial scale	Low
Duration	Long
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

This is a significant positive impact which will last for as the project life time.

6.14.3 Income Generating Activities

All the households indicated that they will embark on income generating projects like poultry and vegetable growing if water is available. They indicated that under the current economic situation it would be desirable to have a project that gives them an income, even just a vegetable garden. However, this is difficult without water close by. The introduction of reticulated water will enable the households to engage in these activities.

Assessment for income generating activities during operation phase

Assessment Criteria	**Rating**
Type/status	Positive
Extent or spatial scale	Low
Duration	Short long
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	Low

This is a positive impact of moderate significance and will last for as long as the project is in existence.

6.14.4 Speed up Construction

Construction of houses in the new areas of has slowed down because of the problem of the availability of water. Those constructing houses have to pay vendors to ferry water from the borehole to their stands. The plot owners pay $5 for a 200 litre drum of water. This makes the construction process expensive and slow. However, it creates employment for those who are in the informal business of ferrying water.

Assessment for speeding construction during operation phase

Assessment Criteria	**Rating**
Type/status	Positive
Extent or spatial scale	Low
Duration	Long
Mitigatory potential	High
Acceptability	Low
Degree of certainty	Definite
Significance before mitigation	Moderate
Significance after mitigation	Low

6.14.5 Loss of livelihood

The down side of the availability of the water is to render those who are working as water vendors jobless. It was not possible to get exact figures of those working as water vendors at housing construction sites, but a livelihood will be definitely lost as result of the reticulation of the water to the households. Those who are engaged in water vending know that it's a temporary activity and will move to other livelihoods.

Assessment for loss of livelihood during operation phase

Assessment Criteria	**Rating**
Type/status	Negative
Extent or spatial scale	Low
Duration	Long
Mitigatory potential	High

Acceptability	medium
Degree of certainty	Probable
Significance before mitigation	Moderate
Significance after mitigation	moderate

This is a negative impact which is difficult to mitigate. There will always be other avenues for vendors to explore.

6.15 ENVIRONMENT AND SOCIAL MANAGEMENT PLAN FOR ZIMUNYA

Table 10.1: Water Supply Project Biophysical Environmental Management Plan

IMPACT STATEMENT	**PROCESS/ACTIVITY RESPONSIBLE FOR IMPACT**	**PROPOSED MITIGATION OF IMPACT**	**MONITORING AND MANAGEMENT AGENCIES**	**MANAGEMENT AND MONITORING ACTIVITIES**	**TIME FRAME**	**BUDGET (US$)**
Soil disturbance	Walking up and down the proposed trench lines may loosen soil	Avoiding unnecessary movements and pulling of equipment on the ground	RDCs, EMA, ZINWA, Contractor	Check for signs of loose soil along trace lines	Planning phase	Negligible
Siltation	Loose soil can potentially result in siltation during the rainy season	• Attend to loose soil immediately	ZINWA, Contractor	As above	As above	Negligible
Disturbance of vegetation	Cutting down trees along trace lines and pegging sites	• Avoid cutting down tress • Where trees are cut, replant. Replanting should be as close as possible in terms of species and location, and should be in numbers that exceed	Contractor, ZINWA	Mark trees to left standing and check for new trees planted	As above	Negligible

IMPACT STATEMENT	PROCESS/ACTIVITY RESPONSIBLE FOR IMPACT	PROPOSED MITIGATION OF IMPACT	MONITORING AND MANAGEMENT AGENCIES	MANAGEMENT AND MONITORING ACTIVITIES	TIME FRAME	BUDGET (US$)
		losses				
Alteration of soil compaction properties and exposure to erosion	Digging of trenches	Backfill all trenches and sprinkle water on loose soil mounds	EMA, RDC, ZINWA	Backfilling should be carried out immediately after the laying of water pipes	Continuous	Negligible
Extermination of indigenous species, appearance of new species which could be dangerous	Cutting down of trees and other vegetation during trenching	• There is virtually no indigenous vegetation in the areas. • Avoid the little natural vegetation in the area	Community, EMA, RDC	Check routing of pipes to ensure it does not pass through any remaining vegetated areas	Construction phase	Negligible
Dust generation	Trenching and backfilling	Sprinkle water on soil and backfill trenches immediately	ZINWA, RDC, Contractor	Ensure dust suppression methods such as spraying water and revegetation, where necessary	Construction phase	1 000

IMPACT STATEMENT	PROCESS/ACTIVITY RESPONSIBLE FOR IMPACT	PROPOSED MITIGATION OF IMPACT	MONITORING AND MANAGEMENT AGENCIES	MANAGEMENT AND MONITORING ACTIVITIES	TIME FRAME	BUDGET (US$)
Water contamination	Backwashing activities	Filter integrity to be maintained and a dedicated backwash mains and lined backwash ponds	ZINWA, RDC,	Regular blowing of the filters and replacement after design period	Throughout operation phase	Negligible

Table 10.2: Water Supply Project Environmental Management Plan: Socio-economic ImpactsZimunya

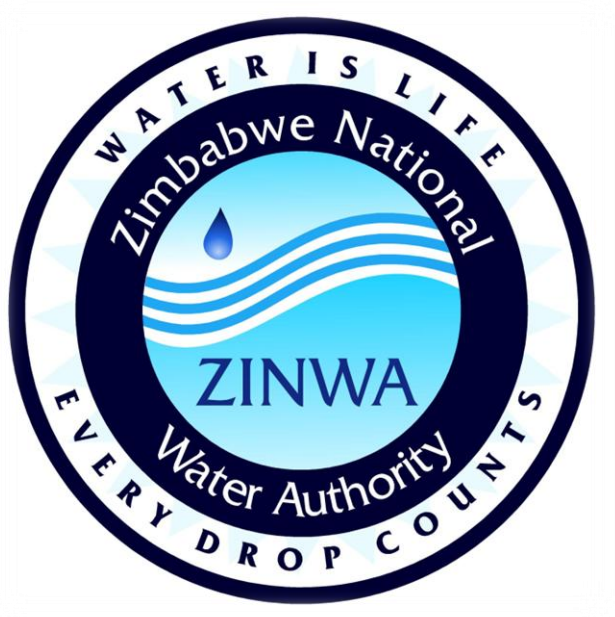
IMPACT STATEMENT	PROCESS/ACTIVITY RESPONSIBLE FOR IMPACT	PROPOSED MITIGATION OF NEGATIVE IMPACT (OR ENHENCEMENT OF POSITIVE IMPACT)	MONITORING AND MANAGEMENT AGENCIES	MANAGEMENT AND MONITORING ACTIVITIES	TIME FRAME	BUDGET (US$)
PLANNING PHASE						
Employment creation	Labourers to assist surveyors and peggers	Employ local youths	Local leadership, ZINWA,	Insist in contractual documents for the employment of	Planning Phase	-

			Contractor	locals		
CONSTRUCTION PHASE						
Creation of employment	Laborers for digging trenches and working with builders	Employ locals	Contractor	Number of locals youths engaged as labourers	Continuous	–
Increased traffic and pressure on roads	Introduction of construction vehicles in the project area	Enforce speed limits; Maintain local roads	ZINWA, RDC Contractors	Place speed limit insignia in the vicinity of project; follow a strict road maintenance schedule	Continuous	3 000
Worker safety	Injuries from blasting or use of machinery	Provide adequate protective clothing and awareness	NSSA, ZINWA, Contractor	Check on protective clothing for workers	Construction	2 000
Injury to school children and others	Falling into open trenches	Backfill trenches immediately	Contractor, ZINWA	All open trenches should be barricaded using safety reflective tape where they cannot be backfilled immediately Trenches to be backfilled at most	Construction	1 000

				after 2 days		
Health and Promiscuity	Moneyed construction workers engaging prostitutes	Awareness campaigns on AIDS and STIs	Contractor	Worker entertainment activities	Construction	1 000
Disturbance and disruption of buried services	Breaking PTC, ZESA cables or sewer lines	Liaise and consult ZESA, PTC or sewer department for any buries services in areas to be trenched. Get maps of services	ZINWA, Contractor	Ensure services maps are available	Construction Phase	500
Disturbance of physical cultural resources	Digging of cutting down trees or disturbance of forests of cultural value. Disturbance could occur through digging up of unexpected archaeological remains	Avoid areas of cultural value	ZINWA, Contractor, Local leadership	Mark all areas of cultural value if any Report findings to National Museums and Monuments	Construction Phase	200
OPERATION PHASE						

Income generating projects	Availability of water will enable college and primary school to embark on poultry and gardening projects	Encourage households to set up projects	RDC, Local leadership,	Number of income generating projects set up	Operation phase	500
Improvement in hygiene and health for school	The availability of clean water at primary school will mean of flush toilets, clean drinking water	Ensure water is available for a minimum of 8 hours every day during school time	ZINWA, RDC,	Check down times for water pumping and quantities against demand	Operation phase	2 000

ENVIRONMENTAL RULES FOR CONTRACTORS



Prepared in Line with the ZINWA SHE Policy (2015)

1 General

In addition to these general conditions, the Contractor shall comply with any specific Environmental and Social Management Plan (ESMP) for the works he is responsible for. The Contractor shall inform himself about such an ESMP, and prepare his work strategy and plan to fully take into account relevant provisions of that ESMP. If the Contractor fails to implement the approved ESMP after written instruction by the Resident Engineer (RE) to fulfill his obligation within the requested time, the ZINWA as the project implementer reserves the right to arrange through the Project Manager (PM) for execution of the missing action by a third party on account of the Contractor.

1.1 Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable negative environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an ESMP. In general these measures shall include but not be limited to:

1.1.1 Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, land clearing, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.

1.1.2 Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

1.1.3 Ensure that there is no disturbance of existing water flow regimes in rivers, streams or dams

1.1.4 Prevent oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, and other natural water bodies/reservoirs, and also ensures that stagnant water within the working area is treated in the best possible way to avoid breeding of mosquitoes.

1.1.5 Upon discovery of ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the PIT so that the appropriate authorities, including the NMMZ may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.

1.1.6 Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

1.1.7 Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.

1.1.8 Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.

1.2 The Contractor shall indicate the period within which he/she shall maintain status on site after completion of civil works to ensure that significant negative impacts arising from such works have been appropriately addressed.

1.3 The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan / strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.

1.4 Besides the regular inspection of the sites by the RE for adherence to the contract conditions and specifications, the ZINWA appointed a Safeguards Officer (SO) based at Catchment offices to oversee the compliance with these environmental conditions and any proposed mitigation measures. In all cases, as directed by the RE and SO, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

1.5 Ensure service maps are available to prevent disturbances and disruption of buried services such as electricity or telecommunication cables or sewer pipes.

2 Worksite/Campsite Waste Management

2.1 Ensure service maps are available to prevent disturbances and disruption of buried services such as electricity or telecommunication cables or sewer pipes.

2.2 All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in line with applicable EMA requirements and conditions set in the ESMP.

2.3 All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with EMA's waste and effluent disposal requirements.

2.4 Construction waste shall not be left in stockpiles along the roads, but removed and reused or disposed of on a daily basis at designated disposal points.

3 Rehabilitation and Soil Erosion Prevention

3.1 To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

3.2 Always remove and retain topsoil for subsequent rehabilitation around temporary camps as possible and re-vegetate areas not required after construction. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.

3.3 Revegetate with local plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem.

3.4 Ensure soil is stockpiled for future use and used to re-profile and rehabilitate closed affected areas.

3.5 Backfilling should be carried out immediately after the laying of the water pipes to prevent exposure to erosion that result in siltation of rivers and dams.

3.6 All open trenches should be fenced off with reflective tape material as they pose a potentially serious safety hazard to the school children and local population (especially at night) or provide proper demarcation and display warning signs.

3.7 Use dust suppression measures such as sprinkling water on soil in working sites and access roads.

3.8 Use only approved sites for sand abstraction pits and solid waste disposal.

4 Water Resources Management

4.1 Abstraction of water from wetlands shall be avoided.

4.2 No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

4.3 Wash water from washing out of equipment shall not be discharged into water courses or road drains.

4.4 Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

5 Traffic Management

5.1 Access roads shall not traverse wetland areas.

5.2 Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

5.3 Place speed limits insignia in the vicinity of projects as there will be increased traffic and pressure on roads.

5.4 Maintain local roads and follow a strict road maintenance schedule.

5.5 Ensure that vehicle washing and machinery maintenance is done only in authorized areas (away from waterways).

6 Blasting

6.1 Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the RE.

6.2 Blasting activities shall be done during working hours, and local communities shall be consulted and notified on the proposed blasting times.

6.3 Noise levels reaching the communities from blasting activities shall not exceed 90 decibels or as guided by the National Social Security Authority (NSSA)

7 Health and Safety

7.1 In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of HIV/AIDS

7.2 Provide safety equipment and adequate protective clothing and awareness to all construction workers to prevent or reduce injuries from work related activities.

7.3 Provide worker entertainment activities and awareness campaigns on STIs and HIV/AIDS to prevent or minimize the spread of STIs and HIV/AIDS through promiscuity of moneyed construction workers engaging prostitutes.

7.4 Adequate signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points

7.5 Construction vehicles shall not exceed maximum speed limit of 40km per hour.

7.6 Seek approval for transportation, use, storage of hazardous chemicals.

7.7 Handle and store all hazardous materials in line with their corresponding Materials Safety Data Sheets.

8 Repair of Private Property

8.1 Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

8.2 In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation

9 Contractor's Safety, Health and Environment Management Plan (SHE-MP)

9.1 Within 6 weeks of signing the Contract, the Contractor shall prepare an SHE-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works.

9.2 The Contractor shall prepare bi-weekly progress reports to the RE on compliance with these general conditions, the project ESMP if any, and his own SHE-MP.

9.3 It is advisable that reporting of significant SHE incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendices to the bi-weekly reports.

10 Training of Contractor's Personnel

The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project ESMP, and his own SHE-MP, and are able to fulfill their expected roles and functions.

11 Cost of Compliance

11.1 It is expected that compliance with these conditions is already part of standard good workmanship and state of the art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable SHE impacts.

7 CONCLUSIONS

The refurbishment and upgrade engineering works planned for the seven priority stations will largely be limited to replacement/upgrading of pumps and motors, raw and clear water mains/pipelines, reservoir tanks and in most cases, backwash mains and settling ponds. In the case of Lupane and Mataga stations, new waterworks need to be completed. All engineering works will be undertaken within already converted land uses, which implies very limited negative biophysical or even socio-economic interference with environmental/ecological systems and services as well as livelihoods and social well being of the neighboring and interested human communities. The minor negative biophysical impacts related to the construction and operation phases (construction equipment/vehicle and construction work force related pollution and externalities and consequences of increasing numbers of residents due to availability of water) can all be adequately mitigated. Furthermore, the health and livelihoods gains by the affected communities from these subprojects are so huge and are bound to overwhelm the minor negative impacts with high mitigatory potential.The study concludes that except for Environmental Assessment, none of the subproject activities and impacts are likely to trigger any of the World Bank safeguards policies. The determination of compliance with Zimbabwean laws awaits the outcomes from the prospectus submitted to the Environmental Management Agency. This will in the end determine whether the level of environmental assessment (ESMP) required by the B categorization of the subprojects, according to the World Bank Safeguards Policies complies with the local EMA laws.

References

1. Saterfield, Z. 2005 : Filter Backwashing. *National Environmental Services Centre, Tech Brief*, Vol 5, issue 3

Appendix 1 : Analytical results for clear water average for the month of August

Parameters	**Zimunya**		
	Jun Jul Au		
Total chlorine (ppm)	0.8	1.0	1.0
Residual chlorine (ppm)	0.2	0.2	0.2
pH	7.1	7.05	7.15
Turbidity (NTU)	2.7	3.5	2.6

Appndix 2: List of Stakeholders Consulted

STAKEHOLDER CONSULTATION

1. ZIMUNYA 11 June 2014

Mutare RDC

Mr. S. Chinaka, CEO

Council Engineer

Mr Nyarumbu

Mr. J. Guba, Councillor

Mrs. Mukoko, Nurse in Charge, Zimunya Clinic

Business Community

Mrs. Mubariki, Chair, Zimunya Flea Market Association

Residents

APPENDIX 3

SMALL TOWN WATER SUPPLY PROJECT

QUESTIONNAIRE GUIDE FOR HOUSEHOLDS

1. How many people live t=in the household?

2. What do you do for a living?

3. On Average what is your monthly household income?

4. How much do you spend on food per month?

5. Where do you currently get your water from?

6. If not from your house, how far away is this source? (distance or time in minutes)

7. On average how much do you pay for water per month?

8. How much are you willing to pay?

9. How has the unavailability of water or interruption to the supply affected your household?

10. What would change in your life if you were to get water or to have uninterrupted supplies? Please mention both the good and the bad

11. Any other comments you would like to make.

APPENDICES

APPENDIX 1. TECHNICAL DRAWINGS

APPENDIX 2 STAKEHOLDER CONSULTATION QUESTIONNAIRES

APPENDIX 3 STAKEHOLDER CONSULTATION MINUTE