SFG3246 V10

MINISTRY OF LOCAL GOVERNMENT AND RURAL DEVELOPMENT (MLGRD)

GREATER ACCRA METROPOLITAN AREA (GAMA) SANITATION AND WATER PROJECT

Construction of Road Culvert Drains in GAMA –

DOME-KWABENYA DRAIN CULVERTS

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

April 2017

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ACRONYMS AND ABBREVIATIONS

ARAP	Abbreviated Resettlement Action Plan
BoQ	Bill of Quantities
DUR	Department of Urban Roads
EAR	Environmental Assessment Regulations
EHSD	Environmental Heath and Sanitation Department
EPA	Environmental Protection Agency
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
GAMA	Greater Accra Metropolitan Area
GEMA	Ga East Municipal Assembly
GES	Ghana Education Service
GoG	Government of Ghana
GWCL	Ghana Water Company Limited
IUCN	International Union for Conservation of Nature
LI	Legislative Instrument
MA	Municipal Authority
MLGRD	Ministry of Local Government and Rural Development
MMA	Metropolitan and Municipal Assembly
MMDA	Metropolitan, Municipal and District Assembly
OHS	Occupational Health and Safety
OP	Operational Procedures
PPE	Personal Protective Equipment
S&W	Sanitation and Water
ToR	Terms of Reference
WB	World Bank

EXECUTIVE SUMMARY

The Government of Ghana (GoG) has received financing from the World Bank towards the cost of implementation of the Greater Accra Metropolitan Area (GAMA) Sanitation and Water Project (GAMA S&W Project).

The Government, through the Ministry of Local Government and Rural Development (MLGRD) intends to apply part of the GAMA S&W Project funds to undertake emergency priority drainage intervention to alleviate the situation in flood prone areas by constructing reinforced concrete open and box culverts on some priority roads in the GAMA area where storm water pose a severe risk for environmental sanitation management, lives and economic activities.

Ghana's Environmental Assessment Regulations, 1999 (LI1652) requires that for any start-up project which has potential to impact negatively on the environment and people, the undertaking should be assessed for its environmental and social impacts, and the appropriate mitigation measures identified prior to the undertaking for implementation. The Project has also triggered the World Bank Safeguard policies: ***Environmental Assessment Policy OP4.01*** and the ***Involuntary Resettlement Policy OP4.12.*** These require that any potential environmental and social issues arising from the project implementation should be mitigated.

The Ministry of Local government and Rural development, in seeking to address the flood risk situation on the drains intends to comply with these frameworks (ESMF and RPF) and other relevant national laws, has contracted Messrs. SAL Consult Limited to prepare an Environmental and Social Management Plan (ESMP) for the proposed **construction of culverts at Dome-Kwabenya (Taifa-Burkina Road)** in accordance with the Environmental Assessment Regulations (EAR) 1999, LI 1652 and the World Bank's Safeguards Policy on Environmental Assessment (OP 4.01) and the Involuntary Resettlement Policy OP4.12.

Proposed Culverts to be provided by Project

The proposed culverts to be constructed at Dome-Kwabenya will comprise of the following:

I. 2No twin cell box culverts 12m x 4.0m x2.0 m
II. Single cell box culvert 7.0m x 4.0m x 12.0m

The construction works will include site clearance, excavation of land and drain to remove concrete and debris using heavy duty equipment, cutting of access roads, removal of existing box culverts on the roads and their reconstruction and road diversions.

Approach and Methodology for ESMP

The approach and methodology adopted for the ESMP study include:

- Site inspections;
- Stakeholder Consultation;
- Review of available literature;
- Land Use Studies;
- Socio-economic Studies; and
- Reporting.

Stakeholder Consultations

Stakeholder consultations were carried out with key stakeholders to obtain their comments and concerns on the proposed project with respect to the potential environmental and socio-economic issues and impacts that have been addressed in the study. The stakeholders consulted comprise:

Project proponent:

- Ministry of Local Government and Rural Development/ Project Coordinating Unit
  - Safeguards Specialist

Engineering Consultant

- Weruw Consulting
  - Project Engineer.

Contractor

- Royal House Company Limited
  - Director, Deputy Director, Site Engineer and Accountant

Ministries

- Regional Director Urban Roads.
- Engineer for Urban Roads.

Ga Eat Municipal Assembly

- Municipal Environmental health officer/Project Coordinator
- Quantity Surveyor
- Assembly Man for Dome/ Taifa
- Richard Addo Allotey (Chairman of Residence Association North Dome)

Project Beneficiary Community

- Project Affected Persons

Relevant Policies, Legal and Administrative Frameworks

The relevant national policies to guide the implementation of the proposed drain construction include the following:

- The National Environment Policy (2013);
- The National Environmental Sanitation Policy dated April 2010;
- National Health Policy (2007);
- Riparian Buffer Zone Policy, 2011;
- National Urban Policy Framework and Action Plan, 2012; and
- National Water Policy.

The relevant national laws and legislation particularly to guide the preparation of the ESMP for the proposed project include the following:

- The Constitution of Ghana;
- The State Lands Act, 1962;
- The Lands (Statutory Wayleaves) Act, 1963;

- Lands Commission Act 2008, Act 767;
- Environmental Protection Agency Act 1994, Act 490;
- Environmental Assessment Regulations 1999, LI 1652;
- Fees and Charges (Amendment) Instrument 2015 (LI 2228);
- Water Resources Commission Act 1996, Act 522;
- Local Government Act, 1993 Act 462;
- Lands (Statutory Wayleaves) Act, 1963 (Act 186);
- The State Lands Act, 1963 (Act 125);
- Lands Commission Act, 2008 (Act 767);
- The Labour Act, 2003 (Act 651); and
- Workmen's Compensation Law, 1987, PNDCL 187

Institutional Framework

The ministries responsible for drainage are the Ministries of Water Resources, Works and Housing and the Ministry of Highways and Roads, via the National Environmental Sanitation Policy, which has devolved responsibilities for sanitation and hygiene to the local level, the Ministry of Local Government and Rural Development is also involved.

The responsibility for primary drains, lies with the Hydrological Services Department (HSD) under the MWRWH. The responsibility for the construction of secondary and certain tertiary drains lies with the Department of Urban Roads (DUR), a civil service organization under the Ministry of Roads and Highways. While DUR funds, procures and supervises the execution of works, these responsibilities are gradually devolved to the MMDA.

Description of Environmental and Social Impacts

Activities of potential environmental and social impacts identified with the proposed project are outlined under four (4no.) main phases of the project activities; namely preparatory; construction; operations and maintenance and decommissioning phases.

<u>Preparatory Phase Impacts</u>

The potential significant environmental/social impacts associated with preparatory phase activities include:

- Land/wayleave Acquisition and compensation issues; and
- Occupational Health & Safety and Traffic/Public Safety Issues.

<u>Constructional Phase Impacts</u>

The potential significant environmental/social impacts associated with constructional phase activities include:

- Loss of vegetation and impacts on fauna;
- Water Pollution/Soil Disturbance and Erosion and impact on aquatic life;
- Air quality deterioration;
- Vibration and noise nuisance;
- Visual intrusion;
- Generation and disposal of solid waste;
- Occupational health & safety;
- Public safety & health issues;

- Sanitation and public health; and
- Impact from Influx of Labour.

Operational and Maintenance Phase Impacts

The potential adverse environmental impacts associated with operational and maintenance phase activities include the following:

- Waste disposal;
- Impact on geomorphology, hydrology and aquatic biota;
- Water quality deterioration;
- Public health and safety;
- Occupational health and safety; and
- Sustainability of the drains/risk of flooding.

Operational and Maintenance Phase Impacts

The potential adverse environmental impacts associated with such decommissioning phase activities include the following:

- Occupational/public safety and traffic concerns; and
- Waste management and disposal.

Mitigation/Action Plan

Mitigation and management measures for the significant adverse impacts are stated below.

Mitigation measures/actions for potential significant adverse impacts

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
PPREPARATORY/ PLANNING PHASE						
1.	Land/wayleave Acquisition and compensation issues	• Consult affected property owners/users and seek their consent prior to commencement of construction works. • Ensure fair and adequate compensation is paid to all affected persons prior to commencement of construction activities	- evidence of compensation payment - evidence of reinstatement of affected property	Drain corridor	Monthly. After valuation	MLGRD
CONSTRUCTION PHASE						
1.	Water Pollution/Soil Disturbance and Erosion	• Works will not be executed under aggressive weather conditions such as rains or stormy conditions. • No solid waste, fuels, or oils will be discharged into any section of the drain or waterway. • Construction will be done in sections to minimize impacts and exposure of soil. • heaped sand delivered for construction works will be covered with tarpaulin to prevent wind and water transport of soil particles • Excavated materials and soil, which cannot be used will be disposed of at sites approved by the GEMA Waste Management department. • Works on exposed trenches and earth materials will, as much as possible, be completed before new earth dug and trenches are created. • Temporary sediment barriers to be installed on slopes to prevent silt from entering water courses. • Maintenance, fuelling and cleaning of vehicles and equipment to take place at off-site workshop with adequate leakage prevention measures	- Observable change in turbidity of water - Observable oil sheen - presence of stagnant water	Drain	Daily	Contractor/ Engineering Consultant
2.	Air quality deterioration	• Soil/sand and cement loads in transit will be well covered to reduce dust levels rising above acceptable levels. • Stockpiles of exposed soil and unpaved access roads will be sprinkled with water to regulate dust levels.	-observation of air borne particulates (dust) and exhaust fumes	-Construction site -Immediate environs	Daily	Contractor/ Engineering Consultant

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
		• Use of good quality fuel and lubricants in vehicles, equipment and machinery. • Engines of vehicles, machinery, and other equipment will be switched off when not in use. • Regular scheduled maintenance and servicing will be carried out on all vehicles and equipment to minimise exhaust emissions. • Construction and civil works will be phased out or controlled to reduce emissions from equipment and machinery in use. • Constant watering of Dusty Diversion roads to reduce the amount pf dust particles when cars use them.				
3.	Vibration and noise nuisance	• Excavation and construction activities will be carried out during daylight hours. • Concrete mixer and other construction machines and equipment will be located away from sensitive environmental receptors. • Construction equipment and machinery will be regularly maintained and serviced to reduce noise generation when in use. • Engines of vehicles, equipment and machinery will be turned off when not in use. • Earthworks and other construction activities will be phased out or controlled to reduce noise generation during construction.	-complaints on noise nuisance from community	-Construction site -Immediate environs	Daily	Contractor/ Engineering Consultant
4.	Visual intrusion	• Construction activities will be done in sections to reduce impacts of change and visual intrusions to the general public. • The construction sites will be hoarded off from public view. • Good housekeeping measures, such as regular cleaning, will maintained at the construction site. • Ensure an acceptable post-construction site as per provisions in the contract.	Hoarding in place	-Construction site -Immediate environs	Daily	Contractor/ Engineering Consultant
5.	Disruption of Utility Services and Damage	• Collaborate with the Metropolitan Works and Urban Roads departments to ensure that the highest standards are implemented for the road cutting and reinstatement. • Consult with utility providers to confirm location of their respective assets (pipelines, cables) within the project corridor to prevent blind encroachment	- Indicators and record of the location of utility service lines - Evidence of	Construction site	Daily	Contractor/ Engineering Consultant

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
	Public infrastructure	• Collaborate with the engineers of the utility providers (GWCL/ ECG/Telecommunication providers) to ensure the most appropriate measures are taken to safeguard the integrity of the pipelines/cables. Measures to be implemented include: ○ Avoiding the encroachment on the pipelines or cables ○ Inform the utility providers and the GEMA of any damaged pipeline or cable ○ Promptly repair any damaged pipelines or cables ○ Relocation of pipelines or cables to safe	consultations with service providers - Record of affected service and action taken			
6.	Waste Management	• Excavated earth materials will, as much as possible, be re-used for back filling purposes to reduce waste • Excavated solid waste from the drain channel that are unsuitable for backfilling will be collected onsite, allowed to drain and collected for disposal at sites approved sites in collaboration with the GEMA. • Ensure that the required amounts of construction materials are delivered to site to reduce the possibility of the occurrence of excess material • Provide bins on site for temporary storage of garbage such as lubricant containers, drinking water sachets and carrier bags/packaging materials. • Ensure judicious use of construction materials such as pipes, laterites, sand, etc. to reduce waste • All metal scrap waste will be disposed of at sites approved by the GEMA or sold to approve third party agents for use by metal companies. • Contractor to work according to a prepared and agreed Solid Waste Management Plan. • Ensure that Waste bins/Skips supplied to the communities are emptied on a regular basis	- Availability and use of bins - Records on frequency and location of waste disposal site of domestic and construction waste - Drain desilting schedule developed - Records of inspection and desilting of drains - Options for reuse of collected silt	Construction site	Daily	Contractor/ Engineering Consultant/Waste Management institution contracted by GEMA
7.	Occupational health and	• Engage experienced artisans for construction works. • All workers should be given proper induction/orientation on safety.	- Availability and proper use of PPEs	Construction site	Daily	Contractor/ Engineering

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
	safety	● The contractors will have a Health & Safety Policy and procedures to guide the construction activities. ● Regularly service all equipment and machinery to ensure they are in good working condition. ● Ensure there are first aid kits on site and a trained person to administer first aid. ● Provide and enforce the use of appropriate personal protective equipment (PPE) such as safety boots, reflective jackets, hard hats, hand gloves, earplugs, nose masks, etc. ● Proof of competence for all equipment/machine operators will be required and established through inspection of valid drivers or operator's license or documents. ● Comply with all site rules and regulations. ● Apply sanctions where safety procedures are not adhered to. ● Site meetings should create awareness on OHS.	- Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury - Records on non-compliances			Consultant
8.	Public safety and traffic issues	● Hoard off the construction sites to prevent access by unauthorised persons. ● The culverts will not be constructed simultaneously, they will be constructed one after the other so as to prevent a complete blockage of access roads to homes and shops. When the Third culvert is being constructed, there would be a possible rerouting. (see **ANNEX 3**) ● Transport of materials to the site will not be done during peak traffic hours ● Warning signs and notices will be placed at all dangerous sites, including open trenches meant for culvert construction. ● Provide adequate signage to warn motorists of blockage due to culvert construction. ● Transport of materials to the site will not be done during peak traffic hours between 7am to 9am and 4pm to 6pm. ● Speed limit for all vehicles and construction equipment should be less than 20km/h within the drain construction corridor. ● Ensure delivery trucks hired/contracted are in good condition to prevent breakdowns on roads.	- Hoarding of project site - Records on frequency, type and source of accident/injury - Warning signs and notices in place - Schedule for transport of materials - Child friendly, safe and strong footbridges at right places.	Construction site	Daily	Contractor/ Engineering Consultant

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
		• Provide foot bridges at appropriate locations in consultation with the Assembly member to assist the public to safely cross the drains. The fottbridges should be strong, child friendly and fitted with hand rails to prevent people falling over or the footbridge collapsing.				
9.	Sanitation and public health impacts	• As a policy, open defecation is prohibited, and any construction worker found violating this policy will be sacked. • Provide waste bins at project site to minimise littering of the site, and final disposal of waste will be done at the GEMA approved waste dump sites only. • Ensure the availability of toilet facilities for use by construction workers. • Provide mobile toilet facilities, which must be regularly maintained and cleaned. • Arrange for the possibility of using public toilets or sharing the facility of Accra Academy, so that the mobile toilets would be for emergency situations. • Food vendors and hawkers will be sensitized to use the public toilet facilities in the vicinity of the project area to prevent open defecation. • Drain off all trenches or excavations made during the construction to avoid the occurrence of stagnant water • Potable water in filtered water sachets from certified sources will be made available at workplaces as workers' drinking water.	- mobile toilet facilities in place - presence of stagnant water in drains - availability of potable water to worker	Construction site	Daily	Contractor/ Engineering Consultant
10.	Impact from Influx of Labour	• Workers will be made aware of the Code of Conduct at Induction, weekly safety meetings and Project monthly meetings. • Contractor will ensure all workers comply with the Code of Conduct on site (Annex 2). • Appropriate punitive measure will be applied in the event of any misbehaviour by workers on site. • Open communication channels will be maintained through the grievance redress mechanism to enable the community members report on any misbehaviour by workers.	- Workers aware of the Code of Conduct	Construction site	Daily	Contractor/ Engineering Consultant/

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
11.	Public Complaints/ Grievances	● Implement Grievance Redress Mechanism, which will include such elements as: ○ Lodging and registration of PAPs grievance by grievance redress committee; ○ Redress decision, feedback and implementation; ○ Dissatisfaction and alternative action; and ○ Monitoring and evaluation.	- Type the nature of complaints and concerns; - Complaint records (Record of grievance and number resolved/unresolved) - Management and Stakeholder Meetings	Project community	Weekly	Contractor/ Engineering Consultant/
OPERATIONAL PHASE						
1.	Waste generation and disposal	● Waste management Department of the GEMA to provide and implement a schedule for the maintenance and desilting of all drains within their jurisdiction ● Silt and waste from the desilting/maintenance of drains should be promptly removed from the drain corridor to prevent them from being washed back into drain by runoff and also prevent nuisance to motorists and pedestrians. ● Segregate waste from maintenance/desilting of drains (i.e. separate sand/silt materials from garbage), ● Make available sand/silt materials obtained from desilting of drain to interested local communities and private individuals for their private projects. ● Identify land requiring reclamation and send any excess silt materials to such places instead of to landfill sites. ● Dispose of plastic and other garbage from maintenance and desilting activities at approved dump sites if it cannot be reused.	- Drain desilting schedule developed - Records of inspection and desilting of drains - Options for reuse of collected silt	Drain corridor	-Monthly	Contractor/ GEMA Municipal Environmental Health and Management Department
2.	Water Quality Deterioration	● Maintain vegetation along the drain corridor to retard erosion ● Ensure that contractors do not dispose of any waste oil, or refuse into the drain. ● Ensure prompt removal piles of soil and desilted materials left along drain corridor	- vegetation along the drain corridor maintained - presence of desilted	Drain corridor	-Monthly	Contractor/ Municipal Environmental Health and

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
		during drain maintenance/desilting ● Conduct public education and awareness campaigns on the impacts of inappropriate sanitation practices such as disposal of solid waste and dislodgement of human excrement into drains.	material on drain corridor			Management Department
3.	Public health and safety impacts	● No free range defecation will be allowed within the drain corridor during maintenance for desilting works. ● Keep record of the location all water pipelines in the drain RoW Identified and marked during construction to prevent rupturing during maintenance. ● Ensure that clear signage are provided for uncovered drain	- Availability of signage for uncovered drain - Complaint records (Record of grievance and number resolved/unresolved)	Drain corridor/ Community	Monthly Weekly	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department
4.	Occupational Health and Safety	● Engage experienced artisans for maintenance works. ● All workers should be given proper induction/orientation on safety. ● Ensure contractor have a Health & Safety Policy and procedures to guide the construction activities. ● Ensure there are first aid kits on site and a trained person to administer first aid. ● Provide and enforce the use of appropriate personal protective equipment (PPE) such as safety boots, reflective jackets, hard hats, hand gloves, earplugs, nose masks, etc. ● Proof of competence for all equipment/machine operators will be required and established through inspection of valid drivers or operator's license or documents.	- Availability and proper use of PPEs - Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury - Records on non-compliances	Drain corridor	-Daily	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department
5.	Sustainability of the drains/ Risk of Flooding	● Conduct public education and awareness campaigns on the impacts of inappropriate sanitation practices such as disposal of solid waste and dislodgement of human excrement into drains. ● Sensitise the public to ensure all solid waste and silt are removed from the public drains on the national sanitation day (first Saturday of each month).	- Availability of schedule and plan awareness creation and sensitisation - Record of awareness creation and		Monthly	GEMA Municipal Works Department/ Municipal Environmental Health and

No.	Environmental/ Social Component	Proposed Mitigation Measures	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)
		• Develop and implement a monitoring and maintenance regime for the drains.	sensitization activities carried out - Monitoring and maintenance regime for the drains developed			Management Department
DECOMMISSIONING PHASE						
1.	Occupational/ public safety and traffic	• The contractor will be required to ensure that: • Personal protective gear are provided to workers involved with decommissioning of facilities and camp. • Toilet facilities are available throughout the decommissioning period. • Workers still have access to public toilet facilities in the communities or can be conveyed to such facilities where needed, if mobile toilet facilities have been relocated. • Final movement of its vehicles and equipment comply with approved speed limits within the communities. • All community complaints are resolved before handing over drain project.	- Availability and proper use of PPEs - Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury	Drain corridor	-Daily	Contractor/ GEMA Works Department
2.	Waste disposal	• Ensure that all waste streams created during construction of the drain are collected from work sites and properly disposed of before handing over the project. • Inspect the site to ensure that the contractor has properly cleaned up all construction sites before final payment is made to the contractor.	- Availability and use of bins - Records on frequency and location of waste disposal site of domestic and construction waste	Drain corridor	Daily	Contractor/ Engineering Consultant

Environmental and Social Monitoring Plan and Reporting

Environmental monitoring is an essential component to ensure the successful implementation of the ESMP. An Environmental and social monitoring plan has been proposed to track the implementation of the mitigation measures for the identified impacts in the ESMP. A format for reporting on the extent of implementation if the ESMP has also been prepared as part of the report.

Capacity Building and Other Requirements for Implementation of ESMP and Permit Conditions

Capacity building measures and other requirements proposed (see Section 7.4) to ensure effective implementation of the ESMP and environmental permit conditions are:

- Training workshop and sensitization programmes for the Engineering Consultants, Contractors and their workers, school authorities, school children, GEMA and other key stakeholders on the ESMP and its implementation, EPA permit schedule and triggered World Bank Safeguards Policy;
- Induction on environmental, social occupational and public health and safety requirements of the works;
- Site Meetings; and
- Reporting.

Conclusion

GEMA and the Project Coordinating Unit of MLGRD is committed to ensuring sustainable environmental management and safeguarding the health and safety of the construction workers and the general public during the implementation of the proposed project. The Project Coordinating Unit is also aware of the provisions in the Environmental Assessment Regulations 1999, LI 1652 and the World Bank Operational Policies.

In keeping with these laws, this ESMP has identified and assessed key environmental and social impacts and concerns that may arise from the implementation of the proposed project. A monitoring programme to help detect changes arising from the predicted adverse impacts has also been presented in this ESMP. The recommendations outlined in the ESMP for the project will ensure a high level of health, safety and environmental management for the proposed project.

It is estimated that the implementation of the ESMP in the Ga East Municipal Assembly will cost about **GH¢122,700.00**. The proposed project has the potential to provide numerous short and long-term benefits in the Ga East Municipality and the national economy. These include control of flooding, reduced malaria occurrence, improved sanitation, hygiene and waste management within the Dome Kwabenya community and the Odaw basin as a whole.

1.0 INTRODUCTION

1.1 Background

The Government of Ghana (GoG) has received financing from the World Bank towards the cost of implementation of the Greater Accra Metropolitan Area (GAMA) Sanitation and Water Project (GAMA S &W Project).
The objective of the GAMA S&W Project is to increase access to improved sanitation and improved water supply in the GAMA, with emphasis on low income communities; and to strengthen management of environmental sanitation in the GAMA.

The GAMA Project supports eleven (11) Municipal and Metropolitan Assemblies (MMAs) spread across the Greater Accra Region. The project has four components:

- **Component 1** – Provision of water and environmental sanitation services to priority low income areas of GAMA;
- **Component 2 –** Improvement and expansion of the water distribution network in the GAMA;
- **Component 3 –** Improvement and expansion of waste water and faecal sludge collection, transportation and treatment in GAMA; and
- **Component 4** – Institutional Strengthening.

Over the years, floods have claimed several lives, loss of property and disrupted economic activities resulting from the lack of adequate capacity of road culverts to discharge storm water from streams and communities. The floods often resulted in inundating the entire roads.

The Government, through the Ministry of Local government and Rural Development (MLGRD) intends to apply part of the GAMA S&W Project funds to undertake emergency priority drainage intervention to alleviate the situation in flood prone areas by constructing reinforced concrete open and box culverts (summarized in **Table 1-1**) on some priority roads in the GAMA area where storm water pose a severe risk for environmental sanitation management, lives and economic activities.

Table 1-1: Summary of road culvert drains for GAMA project

No.	Location	Administrative District	Brief description of proposed intervention
1.	Mallam Junction	Ga South Municipality	Construction of: • Double cell drain 150mx4.0mx2.5m; reinforced concrete open rectangular channel 80.0mx7.0mx2.5m (length x width x depth); • Deepening and widening of earth channel 230m long
2.	Kaneshie (Accra Academy)	Accra Metropolis	Construction of: • 540mx4.0mx2.0m (length x width x depth) box drain; • 6.0mx3.5mx1.5m (length x width x depth) open drain • 80.0mx3.5mx1.5m (length x width x depth) open drain.

No.	Location	Administrative District	Brief description of proposed intervention
3.	New Gbawe	Ga South Municipality	Construction of a double cell precast 200mx1.2m (length x diameter) culvert
4.	Dome-Kwabenya	Ga East Municipality	Construction of: • 2No twin cell box culverts 12mx4.0mx2.0m 5m (length x width x depth); and • 3No single cell box culvert 7.0mx4mx12.0m 5m (length x width x depth)
5.	Agbogba	Ga East Municipality	Construction of 1 No double cell box culvert 12.0mx4.0mx2.0m

Ghana's Environmental Assessment Regulations, 1999 (LI1652) requires that for any start-up project which has potential to impact negatively on the environment and people, the undertaking should be assessed for its environmental and social impacts, and the appropriate mitigation measures identified prior to the undertaking for implementation. The Project has also triggered two of the World Bank Safeguards policies: the ***Environmental Assessment Policy OP4.01*** and the ***Involuntary Resettlement Policy OP4.12.*** These require that any potential environmental and social issues arising from the project implementation should be mitigated.

The Ministry of Local government and rural development, in seeking to address the flood risk situation on the drains intends to comply with these frameworks (ESMF and RPF) and other relevant national laws, has therefore contracted Messrs SAL Consult Limited to prepare an Environmental and Social Management Plan (ESMP) for the proposed drain construction at Dome-Kwabenya (Taifa - Burkina road) in accordance with the Environmental Assessment Regulations (EAR) 1999, LI 1652 and the World Bank's Safeguards Policy on Environmental Assessment (OP 4.01) and the Involuntary Resettlement Policy OP4.12.

1.2 Objectives/Purpose of the ESMP

The objective/purpose of this ESMP is to guide the effective mitigation and management of potential environmental and social issues of the proposed construction at **Dome-Kwabenya (Taifa-Burkina road).** The ESMP will assist the implementation of the construction of the road culvert interventions in a manner that any potential impacts are avoided and /or mitigated before, during and after the construction activities.

The specific objectives of the ESMP include the following:

- Identification of possible direct and indirect significant adverse impacts associated with the proposed drain construction;
- Assessment and evaluation of potential impacts of the proposed project on the biophysical and human environment;
- Provision of practical, socially acceptable, technically and economically feasible and environmentally sustainable measures to address the potential adverse impacts; and

- To comply with the Environmental Assessment Regulations (EAR) 1999, LI 1652 and the World Bank's Safeguards Policy on Environmental Assessment (OP 4.01) and the Involuntary Resettlement Policy OP4.12.

1.3 Approach and Methodology

The approach and methodology adopted for the study include:

- Site inspections;
- Stakeholder consultation;
- Review of available literature;
- Land use studies;
- Socio-economic studies; and
- Reporting.

1.3.1 Site Inspections

The Consultants inspected the proposed sites for the drain construction From November 2016 to March 2017, to confirm the environmental and social issues and conditions to be affected or are likely to develop from the implementation of the proposed project. (See **Plate 1-1** and **Plate 1-2**). The inspections covered:

- the physical inspection of the proposed construction sites and their immediate environs;
- identification of potential project affected persons and land use conflict from the proposed drain construction;
- existing waste collection and disposal facilities and water supply facilities; and
- Portions of the drains where construction has started.

Plate 1-1: Site inspection at Dome –Kwabenya (First culvert)

Plate 1-2: Site inspection at Dome –Kwabenya. (Third culvert)

1.3.2 Stakeholder Consultations

Stakeholder consultations involving emails, phone conversations and one-to-one meetings were carried out between December, 2016 and March 2017 with some key stakeholders to obtain their comments and concerns on the proposed project with respect to the potential environmental and socio-economic issues. During the consultations, the project activities of environmental and social concern were discussed with the stakeholders and impacts that have been addressed in the study. Information on project designs and alternative considerations were obtained from the MLRGD, engineering consultant and some contractors.

Key environmental and social issues/concerns obtained from the stakeholder consultations are summarized in **Chapter 5** and incorporated in the analysis of potential impacts and mitigation measures. Evidences of stakeholder consultations are provided in **Annex 1**

Project proponent:

- Ministry of Local Government and Rural Development/ Project Coordinating Unit
  - Safeguards Specialist

Engineering Consultant

- Weruw Consulting
  - Project Engineer

Contractor

- Royal House Company Limited
  - Director, Deputy Director,Site Engineer and Accountant

Ga Eat Municipal Assembly

- Municipal Environmental health officer/Project Coordinator
- Quantity Surveyor

- Assembly Man for Dome/ Taifa
- Richard Addo Allotey (Chairman of Residence Association North Dome)

Regulators for Road Corridor
- Department of Urban Roads

Utility Providers and Regulators
- National Communications Authority;
- Electricity Company of Ghana;
- Ghana Water Company Limited;
- Airtel Ghana Limited;
- Comsys Ghana Limited;
- C-Squared Ghana Limited;
- Globacom Ghana Limited;
- MTN Ghana Limited;
- Tigo Ghana Limited; and
- Vodafone Ghana Limited.

Project Affected Persons/Nearby Residents at the Project Sites
- Project Affected Persons and neighbours (Refer to Annex 1)

1.3.3 Review of Available Literature/project documents

The following project related documents were reviewed:
- Final Draft Resettlement Policy Framework for the Sanitation and Water Project for Greater Accra Metropolitan Area, February, 2013;
- Environment and Social Management Framework (ESMF) for Sanitation and Water Project for GAMA, December 2012; and
- Relevant research work carried out within the project's area of influence.

1.3.4 Land Use Studies

Methods employed included:
- Field observations of existing conditions within the project's area of influence;
- Use of the 1:50,000 topographical maps and satellite images of the project area to demarcate the project area of influence.

1.3.5 Socio-economic Studies

The methodology used for the studies included:
- Observational studies;
- Interviews with farmers within the scheme;
- Interviews with the project affected persons;
- Review of District Profiles for the Ga East Municipal Assembly; and
- Review of District Analytical report for Ga East Municipal Area, 2010 Population and Housing Census, October 2014.

1.3.6 Reporting

The major headings of the report include the following:

a) Executive Summary;
b) Introduction;
c) Description of Proposed Project;
d) Relevant Policies, Legal and Administrative Frameworks;
e) Baseline Environmental and Social Conditions;
f) Stakeholder Consultation;
g) Description of Environmental and Social Impacts;
h) Environmental and Social Impact Mitigation and Management Plan;
i) Conclusions;
j) Bibliography;
k) Annex.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

2.1 Need for the Project

The proposed culverts to be constructed is located within Dome-Kwabenya, near Taifa, in the Ga East Municipality. Over the years the communities have become heavily populated due to the settlements developed in the flood plains of the drains which has resulted in the rapid changes in the land use pattern of the drainage basin.

As a result of the development of settlements, most of the drains are used as garbage dumping receptacles, especially in crowded and low income areas where garbage collecting basins are placed very close to drains. Others are badly choked with weeds and bushes, and serious erosion has damaged drains and culverts in places. Stagnant foul waters are found in drains in the central part of the city where there are stores, markets and restaurants, as well as lorry parks. No maintenance is carried out to remove the garbage and silt in the industrial areas, causing flooding.
The construction of proposed culverts at Dome-Kwabenya is therefore intended to alleviate the situation in flood prone areas.

2.2 Culvert Locations

The proposed culverts would be constructed along (First and second culverts) and across (Third culvert) the Taifa- Burkina Road at Dome –Kwabenya (see **Figure 2-1**) in the Ga East Municipality. The type, dimensions and GPS locations of the proposed culverts are in **Table 2-1** below.

Table 2-1: Dimensions, type and GPS location of culverts

	Culvert type and Dimension	***GPS location***
1.	Twin cell box culvert 12m x4.0m x 2.0m	(5°40'0.82"N,0°14'22.22"W)
2.	Twin cell box culvert 12m x4.0m x 2.0m	(5°40'0.78"N, 0°14'24.53"W)
3.	Single cell box culvert, 7.0m x 4.0m x 12.0m	(5°40'0.80"N, 0°14'27.67"W)

Figure 2-1: Map Showing Residential development around the proposed project area and locations of Culverts.

2.3 Proposed Culverts to be provided by Project

The proposed culverts to be constructed at Dome - Kwabenya will comprise of the following:

i. 2No twin cell box culverts 12m x4.0m x 2.0m; and
ii. Single cell box culvert, 7.0m x 4.0m x 12.0m.

The construction works will include site clearance, excavation of land and drain to remove concrete and debris using heavy duty equipment, cutting of access roads, removal of existing box culverts on the roads and their reconstruction, concrete works to line the culverts, approach filling and road diversions.

The Culvert construction also involves the construction of temporal foot bridges made of good materials and child friendly, property access crossings and safety railing, which will facilitate effective operation and maintenance of a properly designed drainage system

2.4 Equipment and Machinery/Raw Materials

The main equipment for the project are listed below:

- Concrete mixer;
- Excavator;
- Backhoe;
- Tipper truck;
- Water storage tanks;
- Light duty vehicles;
- PPEs such as goggles, hand gloves, safety boots; and
- First Aid Kit/Box. □

The main raw materials to be used include:

- Sand;
- Cement;
- Chippings;
- Water;
- Nails;
- Iron Rods;
- Drain pipes; and
- Drain pipes accessories.

2.5 Labour and Related Issues

The project construction activities will about seventeen (17.No) workers of both skilled and unskilled labour at a time. There shall no work camps for the accommodation of workers on site.

The conduct of workers on site will be guided by the model code of ethics to be adopted by the contractor. In addition, awareness meetings/ workshops will be conducted to sensitize workers on issues such as irresponsible sexual behaviour and HIV HIV/AIDS during project implementation.

3.0 RELEVANT POLICIES, LEGAL AND ADMINISTRATIVE FRAMEWORKS

The relevant national and sector policies and plans, national legal and institutional frameworks and World Bank safeguards policies to guide the proposed Culvert construction at Dome-Kwabenya (Taifa-Burkina Road) are briefly described below.

3.1 Policy Framework

The relevant national policies to guide the implementation of the proposed drain construction include the following:

- The National Environment Policy (2013);
- The National Environmental Sanitation Policy dated April 2010 ;
- National Health Policy (2007);
- Riparian Buffer Zone Policy, 2011;
- National Urban Policy Framework and Action Plan, 2012; and
- National Water Policy.

3.1.1 The National Environment Policy (2013)

The Ghana National Environmental Policy was formulated in 1995 and revised in 2013. The ultimate aim of the National Environmental Policy of Ghana is to improve the surroundings, living conditions and the quality of life of the entire citizenry, both present and future. It seeks to promote sustainable development through ensuring a balance between economic development and natural resource conservation. The policy thus makes a high quality environment a key element supporting the country's economic and social development.

3.1.2 The National Environmental Sanitation Policy dated April 2010

The revised environmental sanitation policy seeks to refocus the priorities of the sector, so it is forward looking and effectively embraces the challenges of changing life-styles associated with modernization and improving wealth status. The policy lays the basis for developing a systematic approach and framework for identifying and harnessing resources for value-for-money (economy, effectiveness and efficiency) services to all.

3.1.3 National Health Policy (2007)

The National Health Policy document which aims at creating wealth through health, among other things places emphasis on improvements in personal hygiene, immunisation of mothers and children. The National Health Policy also argues that a healthy population could only be achieved if there were improvements in environmental hygiene and sanitation, proper housing and town planning, provision of safe water, safe food and nutrition and encouragement of regular physical exercise.

3.1.4 Riparian Buffer Zone Policy, 2011

The riparian buffer zone policy identifies encroachment of watercourses and wetlands as a major cause of flooding in Ghana. To remedy the situation, the policy sets out "to preserve or establish green spaces as riparian buffers along waterways in areas that are practically difficult for

regeneration and reforestation of riparian vegetation as more efficient ways of preventing drinking water contamination and flooding". Measures outlined in the policy to support flood abatement are provision of minimum standards for delineating reservations for various types of water bodies, enforcement of a no development zones around water bodies and removal of unauthorised structures in reservations around water bodies.

The policy seeks to harmonise policies and laws from other sectors in respect to buffer zones but some of its proposals actually conflict with existing planning standards and legislations. For example, the 60-metre buffer along major rivers stipulated in the Riparian Buffer Zone Policy conflicts with the 30-metre standard set in the National Building Regulations (L.I. 1630, 1996).

3.1.5 National Urban Policy Framework and Action Plan, 2012

The goal of the National Urban Policy (NUP) is "to promote a sustainable, spatially integrated and orderly development of urban settlements with adequate housing, infrastructure and services, efficient institutions, and a sound living and working environment for all people to support the rapid socioeconomic development of Ghana. The policy identifies choked drains and frequent flooding as part of the key sources of environmental deterioration. The initiatives to achieve Objective 4: "Improving environmental quality of urban life", includes to "Develop and implement a systematic programme of flood control measures in urban communities (Initiative 4.6)". The key activities proposed in the Action Plan for Initiative 4.6 are as follows:

- 4.6.1 Review existing flood control and management situation and develop, as necessary, drainage/flood control management plans for cities and towns;
- 4.6.2 Monitor, evaluate and revise plans on a regular basis;
- 4.6.3 Prepare a technical manual on urban drainage schemes to guide MMDAs;
- 4.6.4 Institute regular inspection and maintenance of drains; and enforce strict land use controls to prevent building encroachments on drainage channels and nature reserves;and
- 4.6.5 Strengthen the technical capacities of MMDAs for drainage planning, development and management; and flood disaster prevention, preparedness and management

3.1.6 National Water Policy

The National Water Policy was formulated in 2007 within the context of Growth and Poverty Reduction Strategy (GPRS II), New Partnership for Africa's Development (NEPAD) and the Millennium Development Goals (MDGs). The policy objective is to "promote an efficient and effective management system and environmentally sound development of all water resources in Ghana." (Government of Ghana, 2007:12). The highlight of the document is the recognition that water resources have competitive and conflicting uses and is organised around three themes namely water resources management, urban water supply and community water and sanitation.

The water resources management theme discusses issues relating to flood abatement under focal areas 1 and 6 that cover integrated water resource management and climate change/variability respectively. In both focal areas, there is an acknowledgement that water resources are finite and vulnerable given its multiple uses. The plan recognises the need to integrate water resources planning with land use planning activities and adopt river basins as planning units. Finally, water resources were to be protected from human activities and river basin management was to be

integrated with coastal zone and wetlands management. These sections also make statements about the threat posed by extreme weather events, notably flooding.

3.2 National Legal and Regulatory Framework

The relevant national laws and legislation particularly relevant to resettlement and compensation issues as related to the project include the following:

- The Constitution of Ghana;
- The State Lands Act, 1962;
- The Lands (Statutory Wayleaves) Act, 1963;
- Lands Commission Act 2008, Act 767;
- Environmental Protection Agency Act 1994, Act 490;
- Environmental Assessment Regulations 1999, LI 1652;
- Fees and Charges (Amendment) Instrument 2015 (LI 2228);
- Water Resources Commission Act 1996, Act 522;
- Local Government Act, 1993 Act 462;
- Lands (Statutory Wayleaves) Act, 1963 (Act 186);
- The State Lands Act, 1963 (Act 125);
- Lands Commission Act, 2008 (Act 767);
- The Labour Act, 2003 (Act 651); and
- Workmen's Compensation Law, 1987, PNDCL 187.

3.2.1 The Constitution of Ghana and the Protection of Individual Property

Displacement of people

The Project has taken note of Clause 3 of Article 20, which states that:

"Where a compulsory acquisition or possession of land effected by the State in accordance with clause (1) of this article involves displacement of any inhabitants, the State shall resettle the displaced inhabitants on suitable alternative land with due regard for their economic well-being and social and cultural values."

Article 20 of the 1992 Constitution of Ghana provides for the protection from deprivation of property unless such acquisition is made in the interest of defence, public safety, public order, public morality, town and country planning, or the development or utilisation of property to promote public interest.

Under the same Article 20 of the Constitution, such compulsory acquisition of property by the State should be made under a law which makes provision for prompt payment of fair and adequate compensation as well as a right of access to a High Court by any person who has interest in or right over the property for the determination of his interest or right and the amount of compensation to which he is entitled.

3.2.2 The State Lands Act, 1962

The State Lands Act, 1962 (Act 125) vests in the President of the Republic the authority to acquire land for the public interest via an executive instrument. In addition, the State Lands Act, 1962,

details the different elements to be taken into consideration when calculating compensation and these include:

- "Cost of disturbance" means the reasonable expenses incidental to any necessary change of residence or place of business by any person having a right or interest in the land;
- "Market value" means the sum of money which the land might have been expected to realise if sold in the open market by a willing seller or to a willing buyer,
- "Replacement value" means the value of the land where there is no demand or market for the land by reason of the situation or of the purpose for which the land was devoted at the time of the declaration made under section 1 of this Act, and shall be the amount required for reasonable re-instatement equivalent to the condition of the land at the date of the said declaration; and
- "Other damage" means damage sustained by any person having a right or interest in the land or in adjoining land, by reason of severance from or injurious affection to any adjoining land.

3.2.3 The Lands (Statutory Wayleaves) Act, 1963

The Lands (Statutory Wayleaves) Act, 1963 (Act 186) details the process involved in occupation of land for the purpose of the construction, installation and maintenance of works of public utility, and for the creation of right-of-ways for such works. The key elements of this Act include the following:

- The owner/occupier of the land must be formally notified at least a week in advance of the intent to enter, and be given at least 24 hour notice before actual entry;
- Any damage due to entry must be compensated in accord with the procedures established by the Minister unless the land is restored or replaced;
- In the case of highways, no compensation shall be paid, unless the land taken is more than one fifth of the total holdings of an affected person;
- Where a right of way must be established in the public interest, the President may declare the land to be subject to such statutory wayleave; and
- On publication of a wayleave instrument specifying the area required, and without further assurance, the land shall be deemed to be subject to wayleave. Compensation is then determined and paid, with the right of appeal to a Tribunal established by the President, in parallel with the Lands Act, 1962.

3.2.4 Lands Commission Act 2008, Act 767

The Lands Commission Act 2008 re-establishes the Lands Commission to integrate the operations of public service land institutions in order to secure effective and efficient land administration to provide for related matters. The objectives of the Commission include among others to:

- Promote the judicious use of land by the society and ensure that land use is in accordance with sustainable management principles and the maintenance of a sound eco-system; and
- Ensure that land development is effected in conformity with the nation's development goals.

3.2.5 Environmental Protection Agency Act 1994, Act 490

The Environmental Protection Agency Act 1994 (Act 490) gave mandate to the Agency to ensure compliance of all investments and undertakings with laid down Environmental Assessment (EA) procedures in the planning and execution of development projects, including compliance in respect of existing ones.

3.2.6 Environmental Assessment Regulations 1999, LI 1652

The Environmental Assessment Regulations 1999 (LI 1652) enjoins any proponent or person to register an undertaking with the Agency and obtain an Environmental Permit prior to commencement of the project.

3.2.7 Fees and Charges (Amendment) Instrument 2015 (LI 2228)

The Fees and Charges (Amendment) Instrument 2015 (L.I. 2228) replaces the Fees and Charges (Amendment) Instrument, 2014 (LI 2216), and gives regulation to the fees and charges (Miscellaneous Provision) Act 2009, Act 793. The law provides a comprehensive rates, fees and charges collectable by Ministries, Department and Agencies (MDAs) for goods and services delivered to the public.

3.2.8 Water Resources Commission Act 1996, Act 522

The Water Resources Commission Act 1996 (Act 522) establishes and mandates the Water Resources Commission as the sole agent responsible for the regulation and management and the utilisation of water resources and for the co-ordination of any policy in relation to them. Section 13 prohibits the use of water (divert, dam, store, abstract or use water resources or construct or maintain any works for the use of water resources) without authority. The Act states under Section 24 that any person who pollutes or fouls a water resource beyond the level that the EPA may pre-scribe, commits an offence and is liable on conviction to a fine or a term of imprisonment or both.

3.2.9 Local Government Act, 1993 Act 462

This Act establishes and regulates the local government system and gives authority to the Regional Coordinating Council (RCC) and the District Assembly to exercise political and administrative power in the Regions and District, provide guidance, give direction to, and supervise all other administrative authorities in the regions and district respectively. The Assembly is mandated to initiate programmes for the development of basic infrastructure and provide municipal works and services as well as being responsible for the development, improvement and management of human settlements and the environment in the district.

3.2.10 The Labour Act, 2003 (Act 651)

Section 118(1) of the Labour Act 2003 (Act 651) stipulates that it is the duty of an employer to ensure that every worker employed works under satisfactory, safe and healthy conditions. Act 651 contains a number of specific provisions relating to an employer's duty to its workers. These include providing and maintaining "*at the workplace, plant and system of work that are safe and without risk to health*" and taking "*steps to prevent contamination of the workplaces by, and protect the workers from, toxic gases, noxious substances, vapours, dust, fumes, mists and other substances or materials likely to cause risk to safety or health*". A worker is required to report situations that he believes may pose "an imminent and serious danger to his or her life, safety or health".

3.2.11 Workmen's Compensation Law, 1987, PNDCL 187

It is to provide for the payment of compensation to workmen for personal injuries caused by accidents arising out and in the course of their employment. The tenets of the law places a large share of the burden of supporting workers injured at the workplace on the shoulders of the employers.

3.3 Institutional Framework

The ministries with responsibilities for drainage are the Ministries of Water Resources, Works and Housing and the Ministry of Highways and Roads. Via the National Environmental Sanitation Policy, which has devolved responsibilities for sanitation and hygiene to the local level, the Ministry of Local Government and Rural Development is also involved.

The responsibility for primary drains lies with the Hydrological Services Department (HSD) under the MWRWH. The responsibility for the construction of secondary and certain tertiary drains lies with the Department of Urban Roads (DUR), a civil service organization under the Ministry of Roads and Highways. While DUR funds, procures and supervises the execution of works, these responsibilities are gradually devolved to the MMDA.

A schematic overview of the key actors in drainage is given in the **Figure 3-1**.

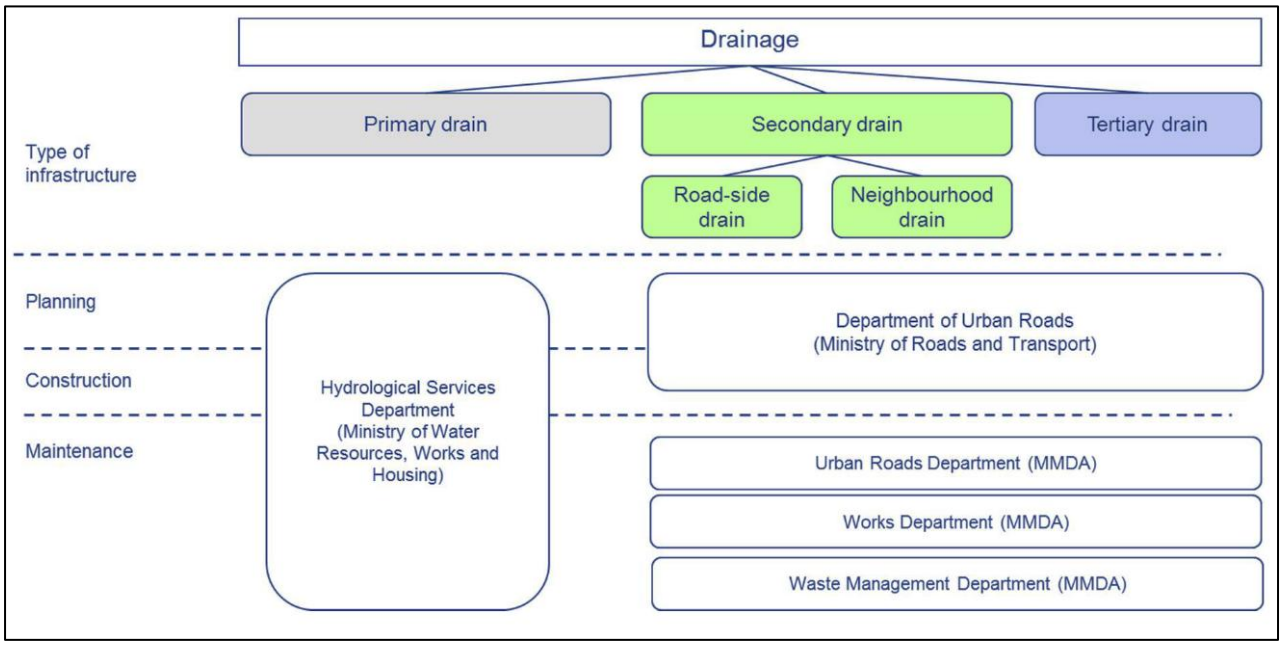

Figure 3-1: Institutional responsibilities in the drainage sector (Source: GNWP TA, September 2014)

3.3.1 Ministry of Local Government and Rural Development

The Ministry of Local Government and Rural Development (MLGRD) exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana to ensure good governance and balanced rural based

development. The MLGRD is the main implementation agency for the GAMA S&W Project, aimed at providing emergency priority drainage intervention to alleviate the situation in flood prone areas.

3.3.2 Ministry of Water Resources Works and Housing (MWRWH)

The Ministry of Water resources, Works and Housing (MWRWH) has the overall responsibility for the initiation, the formulation, implementation and co-ordination of policies and programmes for the systematic development of the country's infrastructure requirements in respect of Works, Housing, Water Supply and Sanitation, Hydrology and Flood Control Systems to ensure efficiency of the sector. The Works Directorate and the Hydrological Services Department of the Ministry have direct responsibility for drainage and flood control measures.

The main objective of the Works Directorate is to facilitate the formulation of policies for the construction industry (building and drainage), and the protection of Ghana's coastline through the following:

- Liaise with PPME Directorate in the development of sectoral policy;
- To collate plans, programmes and projects emanating from policies and objectives of the sector as well as assist in the development of strategies for the determination of works priorities;
- To programme and coordinate the construction, rehabilitation, maintenance and reconstruction of state properties i.e., public buildings and Government bungalows;
- To programme and coordinate the construction, rehabilitation, maintenance and reconstruction of storm water drainage systems and coastal works;
- To liaise with works sub-sector implementing Agencies to ensure that, their programmes are integrated into well-defined national and sectoral plans and priorities;
- To prepare short, medium and long-term plans for the sub-sector to attract donor funding;
- To monitor the implementation of all works related field programmes and projects.

The Hydrological Services Department is an agency of the Ministry has the responsibility of programming and the co-ordination of coastal protection works, the construction and maintenance of storm drains countrywide and the monitoring and evaluation of surface water bodies in respect of floods.

3.3.3 Environmental Protection Agency

The Environmental Protection Agency is the body responsible for regulating the environment and ensuring the implementation of government policies on the environment. The functions of the Agency include:

- ensuring compliance with any laid down environmental impact assessment procedures in the planning and execution of development projects, including compliance in the respect of existing projects;
- promoting effective planning in the management of the environment;
- imposing and collecting environmental protection levies in accordance with the Environmental Protection Agency Act 1994, Act 490 or regulations made under the Act; and
- Acting in liaison and co-operation with government agencies, District Assemblies and other bodies and institutions to control pollution and generally protect the environment.

3.3.4 Department of Urban Roads (DUR)

The responsibility for the construction of secondary and certain tertiary drains lies with the Department of Urban Roads (DUR), a civil service organization under the Ministry of Roads and Highways. While DUR funds, procures and supervises the execution of works, these responsibilities are gradually devolved to the MMDA. Thus for the maintenance of secondary and tertiary drains in the MMDA, the Urban Roads Department (URD) is the first responsible entity.

3.3.5 Ga East Municipal Assembly

Metropolitan, Municipal and District Assemblies (MMDAs) are responsible for the provision of water and sanitation services within their respective areas of jurisdiction, including the planning and implementation of projects where necessary.

The proposed Dome-Kwabenya Culvert construction falls within the jurisdiction of the Ga East Municipal Assembly The Ga East Municipal Assembly was carved out of the then Ga District and was established in 2004 by an Act of Parliament (Legislative Instrument 1864) as a district. It was elevated to a Municipality in 2007 through LI 2061.The Assembly serves as the planning authority responsible for the overall development of their areas of jurisdiction.

The Works Department – in charge of the design and management of all building projects of the Assembly – and the Waste Management Unit or Department (WMD) -responsible for ensuring a clean environment. In practice, the coordination between these departments is challenging.

3.3.6 National Disaster Management Organization

The National Disaster Management Organisation (NADMO) is the government agency that is responsible for the management of disasters as well as other emergencies in Ghana. NADMO performs specific functions which are all aimed at ensuring that in times of emergency, the government is ready to support relief efforts. These functions are:

1. Rehabilitation services for victims of disasters;
2. Mobilization of people at various levels of society to support governmental programmes;
3. Ensuring the preparedness of the country in the management of disasters; and
4. Coordinating the activities of various governmental and non-governmental agencies in the management of disasters.

The organization's mandate includes response to earthquakes, floods and rainstorms, and market fires.

3.4 World Bank Safeguards Policies

The World Bank (WB) has published policies/procedures to guide the safe development of projects it is funding. Two (2) of the ten (10) WB Safeguards Policies, **OP 4.01 (Environmental Assessment)** and **OP 4.12 (Involuntary Resettlement)** are triggered by the proposed project. The WB safeguards policies and a summary of their core requirements are provided in **Table 3-1**.

Table 3-1: Summary of World Bank Safeguard Policies

No	World Bank Safeguard Policy	Summary of core requirements	Potential for Trigger under proposed project	Remarks or recommendation for proposed project
1	**OP 4.01 Environmental Assessment**	Requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. The EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and trans boundary and global environmental aspects. It categorizes proposed projects into categories A, B, C or FI based on the extent of adverse impacts anticipated from the project. For Category A and B projects, an ESMP is to be prepared to guide the Implementation of mitigation measures for all identified environmental impacts from the proposed warehouse project.	Triggered	The entire GAMA project being funded by the WB, including the Construction of Institutional Sanitation Facilities in MAs and Construction of Road Culvert Drains falls under category B, and this EMP is in line with the requirement of the policy.
2	**OP 4.04: Natural Habitats**	Do not finance projects that degrade or convert critical habitats. Support projects that affect non- critical habitats only if no alternatives are available and if acceptable mitigation measures are in place. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).	Not triggered	Project locations and design will not affect any critical habitats.
3	**OP 4.09: Pest Management**	Support integrated approaches to pest management, identify pesticides that may be financed under the project and develop appropriate pest management plan to address this.	Not triggered	The project will not involve the use of pesticides.
4	**OP 4.36: Forest**	Aim is to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. Support sustainable and conservation oriented forestry. Do not finance projects that involve significant conversion or	Not triggered	Project location and design will not affect any critical forests.

No	World Bank Safeguard Policy	Summary of core requirements	Potential for Trigger under proposed project	Remarks or recommendation for proposed project
		degradation of critical forest areas.		
5	**OP 4.11: Physical Cultural Resources**	Investigate and inventorise cultural resources potentially affected. Include mitigation measures when there are adverse impacts on physical cultural resources or avoid if possible	Not triggered	No culturally sensitive sites identified.
6	**OP 4.12: Involuntary Resettlement**	Assist displaced persons in their effort to improve or at least restore their standards of living. Avoid resettlement where feasible or minimise. Displaced persons should share in project profits. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.	Triggered	The field studies identified seven (7no.) persons to be affected by the proposed project
7	**OP 4.10: Indigenous Peoples**	Screen to determine presence of indigenous peoples in project area. Policy triggered whether potential impacts are positive or negative. Design mitigation measures and benefits that reflect indigenous peoples' cultural preferences.	Not triggered	No indigenous groups were identified.
8	**OP 4.37: Safety of Dams**	Requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy distinguishes between small and large dams by defining small dams as those normally less than 15 meters in height. Large dams are 15 meters or more in height.	Not triggered	The proposed project does not involve the construction of dams.
9	**OP 7.50: Projects on International Waterways**	Ascertain whether riparian agreements are in place, and ensure that riparian states are informed of and do not object to project interventions.	Not triggered	The proposed project does not involve international waters.
10	**OP 7.60: Projects in**	Ensure that claimants to disputed areas have no objection to proposed project.	Not triggered	No issues of land dispute were

No	World Bank Safeguard Policy	Summary of core requirements	Potential for Trigger under proposed project	Remarks or recommendation for proposed project
	Disputed Areas			identified.

4.0 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

Baseline conditions give the existing status of the environment in the area before the commencement of the proposed project. The information serves the purpose of a base reference against which the changes due to the implementation of the project are measured. The ensuing therefore constitutes the baseline conditions of the proposed project area, which includes the existing physical and socioeconomic environment.

4.1 Location and Size

The Ga East Municipal is located at the northern part of Greater Accra Region. It is one of the sixteen (16) Districts in the Greater Accra Region and covers a land area of about 85.7 square kilometers. The capital of the Municipal is Abokobi. It shares boundaries with the Ga West Municipal to the west, the La - Kwantanang Municipal to the east, Accra Metropolitan to the south and the Akwapim South District to the north. (See **Figure 4-1**).

Ga South Municipal area forms part of a large built-up area called the Greater Accra Metropolitan Area (GAMA) in the Greater Accra Region. GAMA is comprised of thirteen (13) administrative districts (see **Figure 4-1**) namely; Accra Metropolitan Assembly (AMA), Tema Metropolitan Assembly (TMA), Ashaiman Municipal Assembly (AshMA), Ledzokuku-Krowor Municipal Assembly (LekMA), La Nkwantanang–Madina Municipal Assembly (LaNMMA), La Dade-Kotopon Municipal Assembly, Adentan Municipal Assembly (AdMA), Kpone-Katamanso District (KKD), Ga-East Municipal Assembly (GEMA), Ga-West Municipal Assembly (GWMA), Ga Central Municipal Assembly (GCMA) and Ga-South (GSMA).(see **Figure 4.2**)

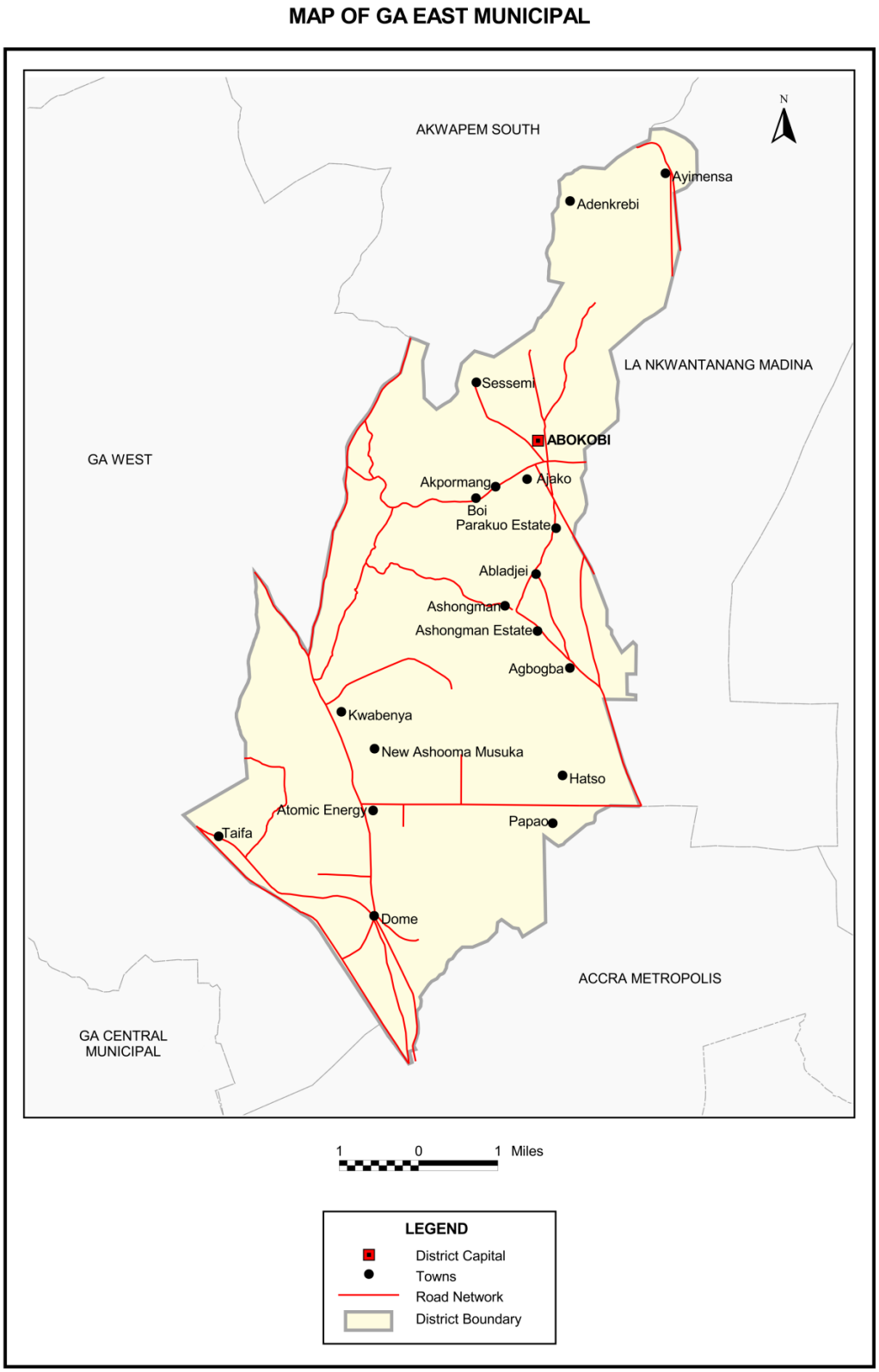

Figure 4-1: Map of Ga East Municipal Assembly (Source: Ghana Statistical Service, 2014)

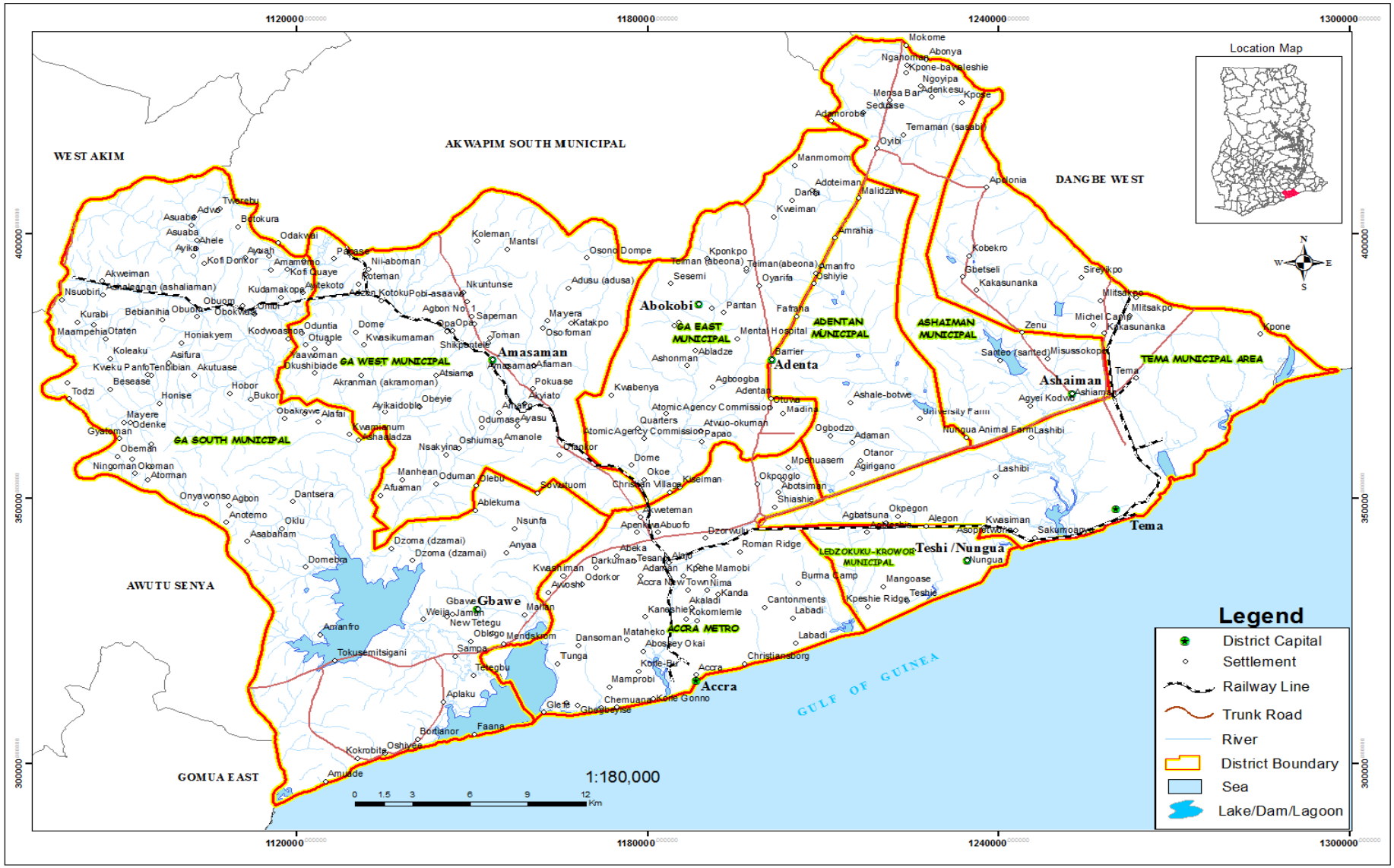

Figure 4-2: Map of Greater Accra Metropolitan Area (GAMA)

4.2 Physical Environment

4.2.1 Climatic Conditions

The Ga East Municipal falls in the savannah ecological zone. Rainfall pattern is bi-modal with the average annual temperature ranging between 25.1°C in August and 28.4°C in February and March. February and March are normally the hottest months.

4.2.2 Relief and Drainage Systems in Accra

River Basins

The existing drainage system in the GEMA is based on gravity flow with most of the drainage basins being open. GAMA comprises 4 principal catchment basins for the main streams of rivers flowing into various lagoons and the sea. These are:

- Densu River basin, to the west of the city, which drains into the Sakumo Lagoon and then into the sea (Gulf of Guinea);
- Odaw-Korle-Chemu catchment which passes through the middle of the city with a number of tributaries;
- Kpeshie catchment to the far east of the city; and
- Songo-Mokwe catchments or drainage systems to the far east of the city.

In between these basins there are several minor drainage basins which outfall to the sea, including Kpeshie, Korle, Densu, Sakumo, Lafa, Osu, Songo Mokwe and Chemu Basins. **Figure 4-3** shows the drainage system of GAMA.

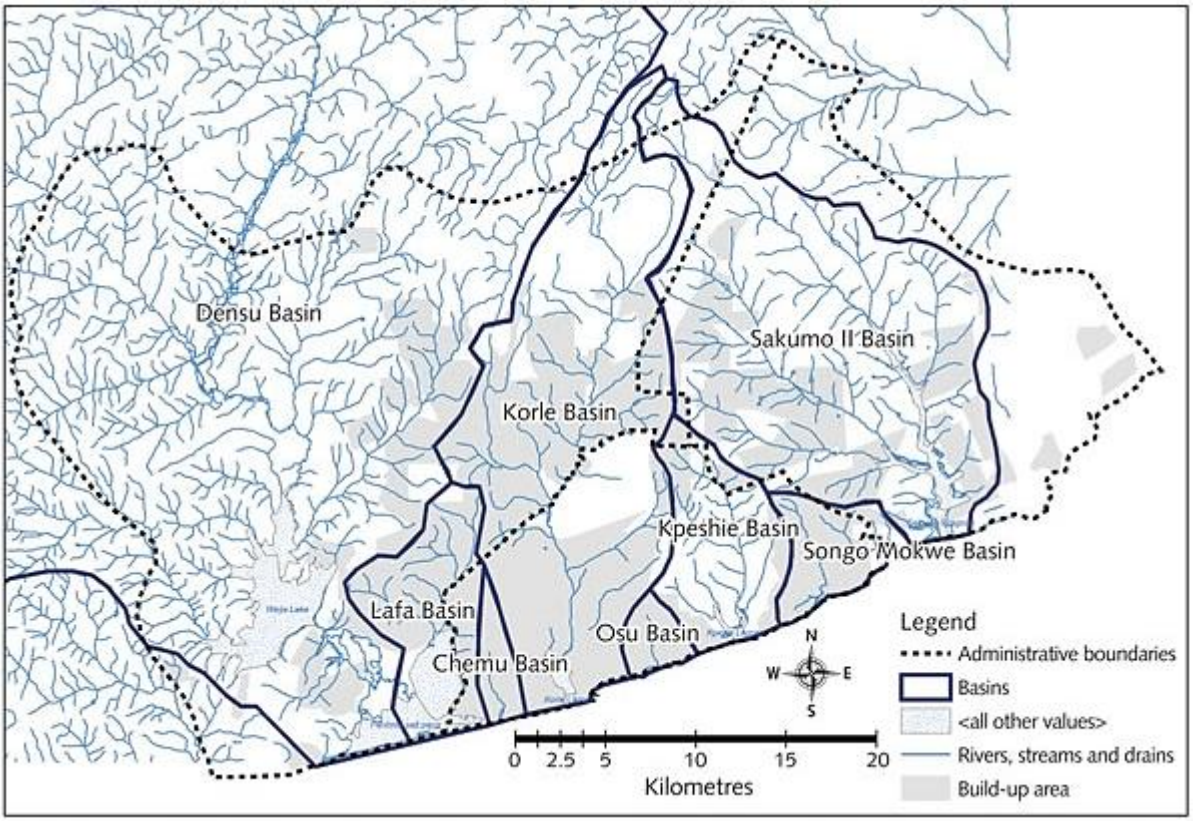

Figure 4-3: Basins in the Greater Accra Metropolitan

The proposed Dome-Kwabenya Culverts falls within the Odaw-Korle-Chemu catchment which covers an area of 250 km^2 and passes through the most urbanised spaces of Accra. The Odaw stream is the main stream, with major tributaries of the Dzorwulu and Nima streams flowing from the east. The Onyasia River (Dzorwulu) joins the Odaw immediately upstream of the Nsawam Road crossing at Caprice while the Nima Stream, joins just south of Kwame Nkrumah Circle at Ring Road. Sections of the main Odaw and Nima channels have been desilted, while the remaining sections are yet to be lined. The primary drains, namely the Kaneshie, KorleGonno, Awudome, Kpehe and others have been lined.

The Odaw River catchment is approximately 30km long with its headwaters near Aburi in the north. It discharges into Korle lagoon, the outlet to the Gulf of Guinea in Accra in the south. The widest part of the catchment is just over 10km wide just north of Accra. Small tributaries also flow to the Odaw River in Accra. The low-lying plains of the Odaw stretch from Korle Lagoon to the confluence of the Dzorwulu and the Odaw near Abuofo in the north. Korle Lagoon occupies a large portion of the lowest lying area of the basin and stretches northwards about 1.5km.

The lower Odaw area is the centre of all commercial and industrial activities of the city, resulting in the construction of commercial houses, financial institutions, industries, roads and other infrastructure including drains. Major drains have been constructed to carry storm water and dry weather flows, from industrial and commercial operating areas as well as residential areas. Secondary and tertiary drains are provided alongside roads to carry runoff and sullage water from houses along these roads.

The drains are in deplorable conditions as a result of poor and, in some cases, lack of maintenance; dumping of refuse and human excreta in the drains; flow obstructions caused by service and utility lines; undersized culverts crossing roads and unauthorized structures located within the flow paths of some of the drains. Some portions of the drains need lining to check scouring and to improve their carrying capacities.

4.2.3 Susceptibility to Flooding in GEMA

Runoff Discharge

With increased urbanisation in Accra, runoff coefficients and peak discharge of the various rivers in the city have been high. The peak run-off determined is presented in **Table 4-1**.

Table 4-1: Total run-off discharge of Accra's hydrology (Source: Nyarko et al)

Name of catchment	Area (km^2)	Runoff coefficient	Storage coefficient	Rainfall intensity (mm)	Peak run-off (m^3/s)
Densu-Sakumo	393	0.7	0.5	140.2	1,444–3,251
Kpeshie	62.6	0.7	0.2	140.2	344
Songo-Mokwe	30.7	0.8	0.3	140.2	105–115
Odaw-Korle-Chemu	250	0.9	0.2	140.2	2350

Table 4-1 shows the total run-off discharge over the land surface of the Accra Metropolis and hence the maximum flood that the various areas are likely to experience in the event of intensive precipitation. From this table, the Odaw-Korle-Chemu and Densu-Sakumo being the biggest catchments produce a total discharge rate of 2,350 m^3/sec and 3,251 m^3/sec, respectively, if their entire catchments contribute to run-off at the same time. With limited drains, increasing impervious surfaces and unpredictable extreme precipitation events, Accra's hydrology is susceptible to high storm water run-off increases in the years to come.

Current flood risk

Accra's exposure and vulnerability to flood hazards is primarily associated with uncontrolled growth of informal settlements in low-lying and flood-prone areas. A study conducted by C. Amoako et al, 2014, identified three areas of flood vulnerability in the GAMA:

a. areas of frequent flooding due to insufficient drainage network, clogged drains and overflow of lagoons/rivers;
b. low-lying flood-prone areas yet to experience flood hazards; and
c. Wetlands or swampy areas.

The high-risk zones are concentrated along the coastal front and within the flood plains of the major rivers, which drains the city, notably the Odaw River. Flood areas in GAMA mostly found in low lying areas and in most instances closely associated with drainage systems. Flood areas have elevation ranging between -7.3 m below sea level – 105.8 m above sea level. About 99.9% of flood areas have elevation of less that 100m above sea level and about 74% of the flood areas lie below 50m contour.

The occurrence of floods inevitably results in the destruction of property and loss of lives. Table 4-3 gives a summary of flood events, number of communities and residents affected and the estimated cost of damage in GAMA spanning the period between 2000 and 2012 compiled data from NADMO, HSD and reports from local media. **Table 4-2** indicates that 83 people have been killed directly by

flood hazards over the period in the GAMA. Over the same period, about 178,750 people have been displaced by flood hazards with an estimated total cost of damages and loss standing at about US$43.7 million.

Table 4-2: Major flood hazards and their impacts in Accra (2000–2012)

Date	No. of communities affected	No. displaced	Casualties	Estimated cost of damage (million US$)
7 May and 5 June 2000	49	6,584	12	5.65
1 June 2001	65	41,450	13	10.00
6 January, 9 and 13 June 2003	25	2,787	3	2.54
18 June 2003	30	3,140	5	1.71
13 April 2004	9	250	–	0.61
12 March 2005	22	2,370	3	7.35
13 June 2007	40	13,140	5	1.14
27 March 2008	12	1,456	–	0.91
19 June 2009	33	15,616	7	4.12
20 June 2010	42	19,833	17	2.78
25 and 26 Oct 2011	149	65,236	14	4.72
June and October 2012	157	6,888	4	2.18

Source: Compiled from National Disaster Management Organization, Hydrological Services Department and Media Reports (2000–2012).

The most infamous flood occurrence was on June 3, 2015. The June 3, 2015 floods were the result of heavy rains on June 2, 2015, that caused the Odaw River to overflow its banks. Storm drains at Nima and Odawna were filled to the brim, causing intense flooding at the Kwame Nkrumah Circle. The Kaneshie market and its surroundings were submerged, preventing vehicles from moving. Graphic Road, home to some automobile companies, was heavily flooded. The Toyota Ghana and Rana Motors showrooms were completely submerged.

A GOIL fuel station near Kwame Nkrumah Interchange was burnt with people and vehicles in the vicinity. The fire also burnt a Forex Bureau and Pharmacy nearby. The effect of this flood on was without question the worst in years – with fatalities hovering close to 200 persons. In addition to loss of life, the loss and damage to our homes, local businesses, property and livelihoods are inestimable

4.2.4 Vegetation

The Municipality falls in the savannah agro-ecological zone. Rainfall pattern is bi-modal with the average annual temperature ranging between 25.1oc in August and 28.4oc in February and March. February and March are normally the hottest months. The District has two main vegetation namely shrub lands and grassland. The shrub lands occur mostly in the western outskirts and in the north towards the Aburi hills and consist of dense cluster of small trees and shrubs that grow to an average height of about five meters. The grassland which occurred to the southern parts of the municipality

has now been encroached upon by human activities including settlements. **Figure 4-4** shows the reduction in the quantity of rainfall in 2013 in comparison to 2012

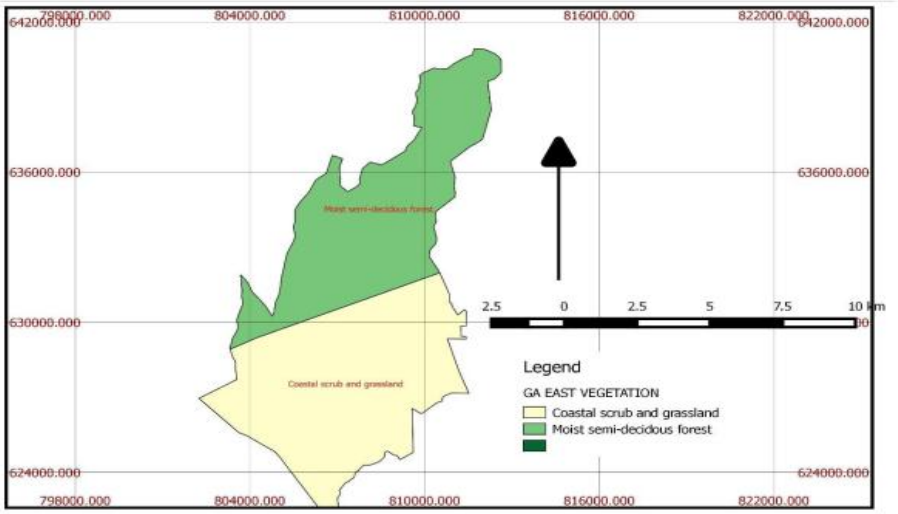

Figure 4-4: Vegetation Map of Ga East Municipal

4.2.5 Geology and Soils

The soil types that exist in the Municipal include but not limited to the following. They are fete consociation located at Abokobi, Adenkrabi and Akporman. It is very shallow and excessively well drained, pale coloured sandy loam and contains small pieces of rock on steep slopes. Nyigbenya, Haatso Complex Association is located at Agbogba, Haatso, Kwabenya, Taifa and Dome. It is well drained red, sandy clay loam to clay with abundant rough stone and quartz gravel. This soil types are suitable for permanent forest. However, Danfa-Dome association and Fete Bediesi complex association located at Danfa to Dome and Sesemi respectively are good for rice, sugarcane vegetables and cotton production. The rest are maize, yam cowpea, soya bean, cassava and others.

4.2.6 Seismic Activity

Generally, Ghana is a stable land mass, and features very low seismic activity. The exception is the coastal region of Ghana, that is, along the Gulf of Guinea, where earthquakes up to magnitude 5.5 to 6.5 according to the Richter scale have been recorded historically (in 1906 and 1939) and occur on repetitive periods of between 50 and 140 years (GWCL & GNWP, 2015).

For all the earthquakes, which have occurred in the country, the epicentres were located along the coast, in the area surrounding Accra, the national Capital, and Cape Coast, the regional capital of Central Region and surroundings, and these areas suffered relatively minor damages. In the past fifteen years seismic events of minor scales between 2 and 4 on the Richter Scale have been measured three or four times a year, and it is likely that the coastal weakness is renewed with each event. Building foundations, water and sewerage pipes, oil pipelines and power cables might therefore be affected in the event of a major earthquake of the magnitude of that of 1939, (GWCL & GNWP, 2015).

It is suggested that any type of foundation adopted for projects in the area should take into consideration an appropriate seismic factor.

4.3 Socio-Economic Environment

The socioeconomic characteristics of the project area are presented below

4.3.1 Demographic Characteristics

The analysis of the demographic characteristics of a population assists planners and policy makers to design sustainable policies to address the developmental needs and challenges of the people. This chapter deals with the demographic characteristics of the population in the Ga East Municipal and deals with issues such as the population size and distribution, age-sex structure, age dependency, and migration.

4.3.1.1 Population Size and Distribution

The Ga East Municipal has a population of 147,742 according to the 2010 PHC, out of which 72,987 (49 percent) are males and 74,755 (51 percent) are females. **Table 4-3** shows that the 0-4 age group constitutes the highest proportion of 12.2 percent, followed by the age groups 25-29 years with 11.7 percent and 20-24 years with a proportion of 11.2 percent. The lowest proportion of 0.1 percent of the population was reported for age group 95 years and older. The distribution of the population by sex and locality follows the same pattern as reported for both sexes. The table again shows that, 90 percent of the population in the Municipality resided in urban areas whiles only 10 percent are in rural areas.

Table 4-3: Population by age, sex and type of locality

	Both Sexes		Male		Female		Sex ratio
Age Group	Number	Percent	Number	Percent	Number	Percent	
All Ages	147,742	100.0	72,987	100.0	14,557	100.0	97.6
0 – 4	18,015	100.0	9,121	11.9	1,672	11.5	102.6
5 – 9	14,440	100.0	7,245	9.6	1,454	10.0	100.7
10 – 14	13,868	100.0	6,606	9.7	1,403	9.6	91
15 – 19	13,148	100.0	6,080	9.5	1,329	9.1	86
20 – 24	16,611	100.0	7,869	11.7	1,540	10.6	90
25 – 29	17,278	100.0	8,266	12.1	1,663	11.4	91.7
30 – 34	14,282	100.0	7,163	9.5	1,366	9.4	100.6
35 – 39	11,181	100.0	5,806	7.2	1,080	7.4	108
40 – 44	8,324	100.0	4,416	5.2	799	5.5	113
45 – 49	5,953	100.0	3,141	3.8	640	4.4	111.7
50 – 54	4,797	100.0	2,412	3.2	496	3.4	101.1
55 – 59	3,195	100.0	1,669	2.0	349	2.4	109.4
60 – 64	2,328	100.0	1,192	1.5	235	1.6	104.9
65 – 69	1,521	100.0	740	1.0	192	1.3	94.8
70 – 74	1,193	100.0	563	0.8	153	1.1	89.4
75 – 79	656	100.0	299	0.5	87	0.6	83.8
80 – 84	456	100.0	203	0.3	50	0.3	80.2
85+	496	100.0	196	0.4	49	0.3	65.3

Source: Ghana Statistical Service, 2010 Population and Housing Census

Figure 4-5 indicates that, the Municipal has a youthful population with the age cohorts 0 - 4, 5 - 9, 10 - 14, and 25 -29 having the majority of the population. The population pyramid for the Ga East Municipal reflects a typical feature in developing countries population with a broad based youthful population and a narrow apex suggesting fewer aged persons.

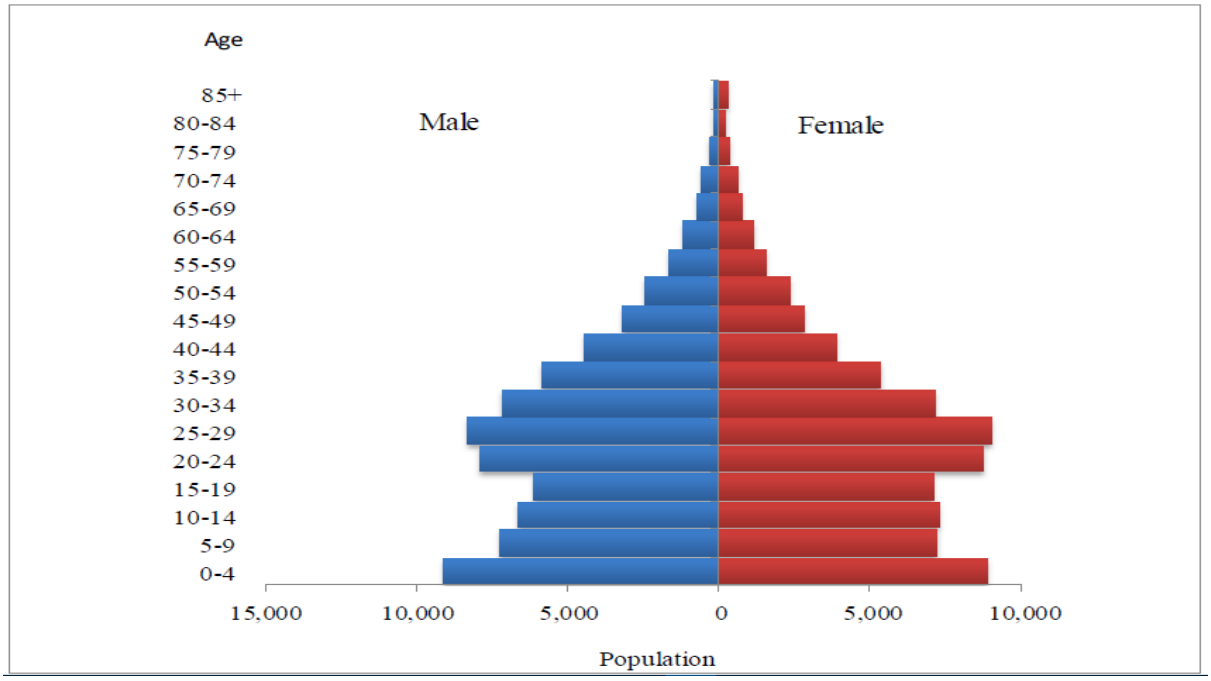

Figure 4-5: Population pyramid

4.3.1.2 Age dependency ratios

The age dependency ratio by sex and locality is presented in **Table 4-4**. The relationship between the population aged 0-14 years and 65 years and above and those aged 15-64 years constitute the age dependency, measured per 100 populations. In Table 2.2, the age dependency ratio is 52, which means that for every 100 people aged 15-64 years; there are approximately 52 people depending on them for survival. The dependency ratio is lower in urban areas (52.0) than in rural areas (53.3) while it is almost the same between both sexes.

Table 4-4: Age dependency ratio by type of locality

	Sex			Sex	Type of locality	
Age Group	Both Sexes	Male	Female	ratio	Urban	Rural
All Ages	147,742	72,987	74,755	97.6	133,185	14,557
0-14	46,323	22,972	23,351	98.4	41,794	4,529
15-64	97,097	48,014	49,083	97.8	87,600	9,497
65+	4,322	2,001	2,321	86.2	3,791	531
Age-dependency ratio	52.2	52	52.3		52	53.3

Source: Ghana Statistical Service, 2010 Population and Housing Census

4.3.1.3 Migration

Migration is one of the components of population dynamics. The section discusses the migrants, their birthplace and duration of residence. Out of the total population of 147,742 in the Municipality, 105,922 representing 71.1 percent of the population are migrants. Regarding those who had migrated into the Municipality, the highest proportion of 33.8 percent had lived there for 1-4 years followed by 21.3 percent who have stayed for 5-9 years and 20.4 percent who have spent 10-19 years. The data further shows that, out of the migrant population of 105,922 in the Municipality; about 25 percent (26,433) were born in the Eastern region. Among the migrants from the Eastern region, the highest proportion of 31.1 percent had lived in the Municipality for 1-4 years, and 12.3 percent had stayed there for over 20 years. The Upper West region has the lowest number of (599) migrants with 31.6 percent staying for 1-4 years, and 12.4 percent had stayed there for over 20 years. A little over four in ten (43.0%) of the migrants from outside Ghana had lived in the Municipality for 1-4 years.

Table 4-5: Birthplace and duration of residence of migrants

District	Population	Number of women 15-49 years	Number of births in last 12 months	Total Fertility Rate	*General Fertility Rate	**Crude Birth Rate
All Districts	4,010,054	1,203,838	91,077	2.6	75.7	22.7
Ga South Municipal	411,377	117,377	13,078	3.9	111.4	31.8
Ga West Municipal	219,788	64,817	5,783	2.9	89.2	26.3
Ga East Municipal	147,742	44,036	3,703	2.8	84.1	25.1
Accra Metropolis	1,665,086	514,523	32,770	2.2	63.7	19.7
Adenta Municipal	78,215	23,158	2,033	2.7	87.8	26
Ledzokuku/Krowor Municipal	227,932	69,038	4,990	2.4	72.3	21.9
Ashaiman Municipal	190,972	57,936	4,489	2.6	77.5	23.5
Tema Metropolis	292,773	89,924	6,138	2.3	68.3	21
Shai Osudoku	51,913	13,269	1,222	3	92.1	23.5
Ada East	71,671	17,576	1,817	3.5	103.4	25.4
Ga Central Municipal	117,220	34,365	3,193	3.1	92.9	27.2
La Dade Kotopon Municipal	183,528	56,845	3,466	2	61	18.9
La Nkwantanang Madina Municipal	111,926	35,055	2,514	2.5	71.7	22.5
Kpone Katamanso	109,864	32,751	2,681	2.6	81.9	24.4
Ningo Prampram	70,923	18,932	1,558	2.8	82.3	22
Ada West	59,124	14,236	1,642	4	115.3	27.8

Source: Ghana Statistical Service, 2010 Population and Housing Census

4.3.2 Education and Literacy

The distribution of schools in the Municipality is quite even. There are six (6) privately owned Senior High Schools, which include Perfect Senior High School, The Masters School and Maxvic School, Dard Senior High School, Oxbert Senior High School and Christ International Senior High School. The Municipality, however, is yet to have a public Senior High School of its own. There are 31 public Basic Schools made up of Kindergarten, Primary and Junior High Schools and a 109 private schools that are sited mainly in the peri-urban areas of the Municipality. Most of the schools lack libraries, ICT resource centres and recreational grounds. It is home to the University of Allied Science that has trained many high and low level manpower management human resource needs of the Municipality.

It is also home to the Ghana Atomic Energy School and Research, which has done a lot of research in to energy. From the Early Childhood to the Senior High School (SHS) level, the private sector owned more than two third of the schools.

Not surprising though, pupils in private schools have relatively better infrastructure than their public school counterparts in the Municipality. The problems of inadequate and poor quality infrastructure in the public schools can be found throughout the Municipality.

Overcrowding with an average of about 120 pupils in a class has compounded the problems in the public schools in the urban areas of the Municipality including Dome, Haatso, Taifa and Kwabenya. This means the numbers of pupils exceed the number of classrooms and therefore the children are overcrowded. This situation is affecting the quality of education and increasing concerns about the competence and image of our public schools. Unlike the situation in the urban and peri-urban areas enrolment is low in the rural areas especially Adenkrebi. The same trend applies to staffing.

4.3.3 Employment and Industry

About 43.4 percent of the employed populations in the Municipal are self-employed without employees. Females (54.6%) are more likely to be self-employed without employee(s) than males (33.1%). Self-employed with employees constitute 9.9 percent while apprentices and casual workers form 2.6 percent each. The private informal is the largest employer in the Municipal, employing overwhelming 70.9 percent of the employed persons.

4.3.4 Water and Sanitation

Potable water supply in the urban/peri-urban areas of the municipality has been a major challenge to the Assembly, especially when the Assembly has no direct control over urban water supply. Areas like Dome, Taifa, Agbogba, Ashongman and Musuko have limited access to pipe-borne water. Others depend on tanker services and a few hand-dug wells. In general therefore, the price of water is fairly high in these urban communities. The situation is further worsened due to the steadily increasing population through the influx of skilled and unskilled labour from the rural areas. To improve this situation the Municipal Assembly will have to support and facilitate government strategies to accelerate the provision of safe water in the urban areas, especially the inclusion of rain water facilities when building. In the peri-urban areas and small towns however, the Municipal Assembly is responsible for water supply.

The Assembly is currently managing two small towns' piped schemes through Water and Sanitation Development Boards (WSDB). These are Abokobi-Oyarifa-Teiman-Sesemi scheme and the Pantang Area Pipe scheme. The two schemes cover 15 communities. This places an obligation on the Municipality to ensure that the facilities are managed in a sustainable manner. The rate of waste generation and management in the Municipality is a matter of concern. With the increasing influx of people and the rapid urbanization, huge amounts of human and industrial waste are generated at an alarming rate. It is estimated that about 385 tons of solid waste is generated monthly out of which 261 tons are collected which represents 67 percent. This leaves a substantial amount of backlog that creates various kinds of inconveniences including health hazard to people in the Municipality. Out of the 261 tons collected the private sector collects about 81 percent through door-to-door collection.

Apart from the door-to-door collection, wastes are collected in containers placed at vantage points by the Assembly. The absence of properly engineered final disposal site is a major constraint.

4.3.5 Waste Management

4.3.5.1 Solid waste disposal

Table 4-6 shows the methods of solid and liquid waste disposal by households in the Municipality. The data shows that the collection method (50.9%) is the most common method used in solid waste disposal by households, while about a quarter (25.7%) of household burn their waste and 10.8 percent use the public dump (container) method. In addition, seven percent of households use the public dump (open space) for disposal of waste while nearly two percent of households dump their waste indiscriminately. The data further shows that 52.6 percent of urban households use the collection method to dispose of solid waste as compared to 35.3 percent of rural households. On the other hand, more rural households (35.7%) than urban (24.6%) households burn their solid waste.

Table 4-6: Method of solid and liquid waste disposal by type of locality

			District					
			Total		Urban		Rural	
Method of waste disposal	Total Country	Region	No.	Percent	No.	Percent	No.	Percent
Method of rubbish disposal								
Total	5,467,054	37,415	37,415	100.0	33,736	100.0	3,679	100.0
Collected	785,889	19,045	19,045	50.9	17,748	52.6	1,297	35.3
Burned by household	584,820	9,609	9,609	25.7	8,294	24.6	1,315	35.7
Public dump (container)	1,299,654	4,045	4,045	10.8	3,768	11.2	277	7.5
Public dump (open space)	2,061,403	2,602	2,602	7.0	2,014	5.9	588	16.0
Dumped indiscriminately	498,868	618	618	1.7	540	1.6	78	2.1
Buried by household	182,615	1,143	1,143	3.0	1,049	3.1	94	2.6
Other	53,805	353	353	0.9	323	1.0	30	0.8
Method of liquid waste disposal								
Total	5,467,054	37,415	37,415	100.0	33,736	100.0	3,679	100.0
Through the sewerage system	183,169	4,676	4,676	12.5	4,050	12.0	626	17.0
Through drainage system into a gutter	594,404	3,610	3,610	9.7	3,180	9.4	430	11.7
Thrown onto the street/outside	1,538,550	5,349	5,349	14.3	4,797	14.2	552	15.0
Thrown into gutter	1,020,096	5,570	5,570	14.9	5,288	15.7	282	7.7
Thrown onto compound	1,924,986	12,541	12,541	33.5	11,218	33.3	1,323	36.0
Other	38,294	280	280	0.7	217	0.6	63	1.7

Source: Ghana Statistical Service, 2010 Population and Housing Census

4.3.5.2 Liquid waste disposal

The table further shows that a third (33.5%) of households throw their liquid waste onto the compound. Almost equal proportions of households ranging dispose of their liquid waste into pits (soak away), onto the street/outside and into the gutter. Significant proportions of households also throw their waste into the sewerage system (12.5%) and through drainage system into a gutter (9.7%). The pattern of liquid waste disposal in the localities is not too different from what pertains in the Municipality but the few differences are that, a higher proportion of urban households (15.7%) dispose of their liquid waste into the gutter as compared to 7.7 percent of their rural counterparts who do same. Again, 17 percent of rural households dispose of their liquid waste through the sewerage system as compared to 12 percent in urban areas.

5.0 STAKEHOLDER CONSULTATIONS

Stakeholder participation during project planning, design and implementation is widely recognized as an integral part of environmental and social management for projects. It is a two-way flow of information and dialogue between project proponents and stakeholders, which is specifically aimed at developing ideas that can help shape project design, resolve conflicts at an early stage, assist in implementing solutions and monitor ongoing activities.

Key project stakeholders were identified for consultations and these included the Ga East Municipal Assembly, Assembly Member for the beneficiary community, Project Affected Persons (PAPs) and their representatives.

5.1 Objectives of consultation

The main objective of the consultations with stakeholders is to discuss the proposed project's environmental and social implications and to identify alternatives for consideration. Specifically, the consultations seek to achieve the following objectives:

- To provide some information about the proposed project;
- To provide opportunities for stakeholders to discuss their concerns and offer recommendations;
- To gain insight on the role of each stakeholder in the implementation of the environmental and social safeguards as well as structures in place for the management of the proposed facilities;
- To provide and discuss with stakeholders the alternatives considered to reduce anticipated impacts;
- To identify and verify significance of environmental, social and health impacts; and
- To inform the process of developing appropriate mitigation and management options.

5.2 Stakeholder Consultation Strategy and Plan

Stakeholder consultation is a process and would continue through the ESMP study stages through to its implementation. **Table 5-1** summarizes the proposed approach for stakeholder engagement.

Table 5-1: Stakeholder engagement programme

No.	Activity	Identified Stakeholders	Focus of Consultation/ Engagement	Timelines/ Frequency	Forms of communication	Facilitator
1.	Preparation of ESMP/ Project design	• Ministry of Local Government and Rural Development/ Project Coordinating Unit, • Weruw Consulting Engineering • Royal House Company Limited • GWCL • ECG • Ga East Municipal Assembly (Urban Roads Department ,Works Engineer,	• Potential environmental and social issues of concern from the proposed project's implementation • Compliance with World Bank and EPA requirements for GAMA S&W Project • Strategies for mitigating the potential impacts and successful maintenance of the proposed facility during their operation • Public and occupational health and safety at construction sites • Scope of interventions of proposed works for culverts.	Throughout the ESMP study period	• One on one Interviews • Field visitation • Sharing and review of relevant reports • Email and phone calls	SAL Consult Limited
2.	Site preparation prior to construction	• Community/ Assembly member • Weruw Consulting Engineering • Royal House Company Limited	• Information on schedule of preparation and construction • Awareness creation on the potential impacts and remedial measures to the community • Integration of the ESMP into planning for construction (impacts and mitigation measures) • Grievance redress procedures • Capacity building for stakeholders for the implementation of the ESMP	Two weeks prior to construction	• Community notifications.	Weruw Consulting Engineering/Royal House Company Limited. GEMA Works Department
3.	Start of construction	• Community/ Assembly member • Weruw Consulting Engineering • Royal House Company Limited	• Information on Schedule of construction works, activities and progress of construction • Awareness creation on the potential impacts and remedial measures to community • Training o ESMP Implementation (impacts and mitigation measures) o Code of Conduct • Grievance redress mechanism	Throughout the construction period	• General stakeholder meeting for Consultant, and contractor • Community notification.	Royal House Company Limited / GEMA Works Department.
4.	End of construction /	• Community/ Assembly member	• Information on Schedule of decommissioning works, activities and progress of	Decommissioning	• General stakeholder meeting for Consultant,	Royal House

No.	Activity	Identified Stakeholders	Focus of Consultation/ Engagement	Timelines/ Frequency	Forms of communication	Facilitator
	Decommissioning of construction equipment and machinery	• Royal House Company Limited (Contractor)	decommissioning • Awareness creation on the potential impacts and remedial measures to students and community • Training o ESMP Implementation (impacts and mitigation measures) o Code of Conduct • Grievance redress mechanism	phase	and contractor • Community notification.	Company Limited / GEMA Works Department.
5.	Commissioning and handing over of Culverts	• Community/ Assembly member	• Roles and responsibilities in the O&M • Training on the Drain Management.	Prior to commissioning	• Community Notification. • Training workshop	Royal House Company Limited / GEMA Works Department.
6.	Operation and maintenance of facility	• Community/Assembly member	• Public awareness creation/sensitisation on waste disposal and maintenance of drains • Operation and Maintenance (O&M) requirements of the culverts • Roles and responsibilities in the O&M • Training on the Drain Management. • Review of grievance	During operation and maintenance period	• General meeting/possible door to door sensitization. • Community engagement	GEMA Works Department/ GEMA Waste Management Department

5.3 Stakeholders Consulted

Key stakeholders to the proposed culverts to be constructed at Dome Kwabenya in the Ga East Municipal have been identified and sampled for consultation. The Consultation of the stakeholders was carried out from November 2016 to March 2017 to gather information, comments and concerns on the proposed project with respect to the potential environmental and social issues and impacts.

The approach adopted for the stakeholder consultations involved one-on-one interviews and focus group discussions. The stakeholders consulted during the ESMP study are listed below.

Project proponent:

- Ministry of Local Government and Rural Development/ Project Coordinating Unit
  - Safeguards Specialist

Engineering Consultant

- Weruw Consulting
  - Project Engineer

Contractor

- Royal House Company Limited
  - Director, Deputy Director, Site Engineer and Accountant

Ga Eat Municipal Assembly

- Municipal Environmental health officer/Project Coordinator
- Quantity Surveyor
- Assembly Man for Dome/ Taifa
- Chairman of Residence Association North Dome

Regulators for Road Corridor

- Department of Urban Roads

Utility Providers

- National Communications Authority;
- Electricity Company of Ghana;
- Ghana Water Company Limited;
- Airtel Ghana Limited;
- Comsys Ghana Limited;
- C-Squared Ghana Limited;
- Globacom Ghana Limited;
- MTN Ghana Limited;
- Tigo Ghana Limited; and
- Vodafone Ghana Limited.

Project Affected Persons and nearby residents consulted at the Project sites

- The names and contacts of project affected persons and nearby residents engaged in the consultation are presented in Annex 1. These people are also presented in the Abbreviated Resettlement Action Plan (ARAP) for the Project.

5.4 Outcome of Stakeholder Consultations carried out during ESMP Preparation

A summary of the outcome of the stakeholder consultations is provided in **Table 5-2**. Further evidence of stakeholder consultations with the various stakeholders/institutions have been provided as **Annex 1**.

Table 5-2: Details of Stakeholder consultations

Stakeholder	Contact Person	Role	Contact number	Date	Concerns raised / information Received
PROJECT PROPONENTS/CONSULTANT/CONTRACTOR/ASSEMBLY MEMBER					
Ministry of Local Government and Rural Development/ Project Coordinating	George Awudi	Safeguard Specialist	0506152780	ongoing	• Provided relevant information and documents on project implementation and environmental and social concerns • Provided input on requirements for compliance with world bank safeguards
GEMA	Mr Derick Tata- Anku Mr. Justin Tsogbe Glover	GAMA Project Coordinator (GEMA**)/** Municipal Environmental Health officer GEMA Works Engineer	0204300105/0267209911 0202409797	ongoing	• Provided relevant information and documents on project implementation and environmental and social concerns. • Also served as liaison between the Environmental Consultant and the Engineering Consultants
Weruw Consulting Engineering	Mr. Wise Ametefe Felix Selanase Tsinase	Consulting Engineer Project Engineer.	0244384254 024467794	ongoing	• Provided assistance in the description of the project Scope. • Also served as a liaison between Environmental Consultant and the contractor.
Royal House Company Limited.	Alex Boadi Elvis K Ezor Emmanuel Mai	Manager Resident Engineer Clerk of Works	0207564495 0234982947 0246635784	ongoing	• Provided a description of the proposed project scope and schedule for construction
Assembly Members.	Mr. Nana Sarfo Gyasi Mr. Okine.(Walle)	Assembly Man for Dome Taifa.	0277769760	March 2017	• Provided assistance in consultation with the Project affected Persons (PAPs) prior to the formation of the Grievance Redress Committee.

		Assembly Man for Dome North	0248913195/0277477939		• Also served as a liaison between the Environmental Consultant and the community.
Utility Providers/Right of Way Users					
Electricity Company of Ghana	• Mr James Teye, Project Engineer Accra West. • Nat Fleischer, Principal Drafts Man Accra west • Mawuli Sallah, Electrical Engineer/ Project supervisor Accra West • Gabriel Narteh, Electrical Contractor.	Service Providers/ RoW user	0243438027 0244125789 0244992903 0200263936	3/03/2017	• There are no power lines of the ECG at the location of the proposed culvert construction.
Ghana Water Company Limited	Engineer Francis Lamptey	Service Providers/ RoW user	0205221912	3/03/2017	• There are no major water supply lines at the location of the proposed culverts
National Communications Authority	Edward Sunderland, Officer (Engineering)	Telecom regulator	0574497157	3/03/2017	• The engineering consultant (Weruw Consult) needs to provide the NCA with drain location maps (KMZ file format). • The NCA will superimpose the map layer over the National Fibre footprint to determine the potential areas of conflict. • The project engineering consultant, .Telecom providers, SAL Consult and the PCU will subsequently be invited to a meeting at the offices of the NCA to share the information and plan for remedial measures.
National Communications Authority and Telecommunications Service Providers: • Airtel Ghana Limited;	See Annex 1 for list of participants	Regulator/ Service Providers	See Annex 1 for list of participants	22/03/2017	• There are no communication lines identified by superimposition of drain location maps over the National Fibre footprint at the offices of the NCA. • There shall be follow up field visits by the NCA, Telcos, SAL Consult Limited and the project implementers (MLGRD-PCU and Weruw

• Comsys Ghana Limited; • C-Squared Ghana Limited; • Globacom Ghana Limited; • MTN Ghana Limited; • Tigo Ghana Limited; and • Vodafone Ghana Limited.					Consult) on Friday, 24 March 2017 to . The teams will then reconvene on Wednesday, 29 March 2017, to confirm the remedial actions and provide associated costs.
National Communications Authority and Telecommunications Service Providers: • Airtel Ghana Limited; • Comsys Ghana Limited; • C-Squared Ghana Limited; • Globacom Ghana Limited; • MTN Ghana Limited; • Tigo Ghana Limited; and • Vodafone Ghana Limited.	See Annex 1 for list of participants	Regulator/ Service Providers	See Annex 1 for list of participants	29/03/2017	<u>Potentially affected service providers</u> • Site visits confirm that there are no communication cable to be affected by the proposed project. <u>Proposed Strategic Action</u> • NCA will organize multi-stakeholder meetings with all the key players involved in the management of RoWs and urban planning to ensure there is coordination of efforts and avoid conflicts in the use of these RoWs. Key players identified include: o National Communication Authority; o Telecommunication providers in Ghana; o Ghana Highway Authority o The Department of Urban Roads, and its national emergency coordination team; o Hydrological Services of Department of the Ministry of Water Resources, Works and Housing; o Ministry of Local Government and Rural Development; o Town and Country Planning Department; o Municipal/Metropolitan Assemblies o Ghana Water Company Limited; and o Electricity Company of Ghana.
Beneficiary Communities/Project Affected Persons (PAPs)					
Taifa—Burkina Co-op Taxi	Stephen Kobbinah	(President)-	0207706970		• There is concern that the proposed works may result in the

Rank	Abraham Agyapong Morgan Duah Seth Smith Emmanuel Donkor	(Vice President)- (Discipline)- (Welfare)- (Welfare Assitant)-	0277301739 0275987599 0243721229 0275992320		relocation of the station and disrupt services. • There is also concern that the works would result in the destruction of the shed for the Taxi rank. • Excavated spoil and the general waste generated during construction should be cleared from the site on completion of the assignment.
PAPs (individuals)	PAPs- The names and contacts are elaborated in the Abbreviated Resettlement Action Plan (ARAP) prepared for the project.				• Elaborated in the Abbreviated Resettlement Action Plan (ARAP) prepared for the project.

Plate 5-1: Consultation with some members of the Taifa- Burkina Co-op Taxi Rank

Plate 5-2: Consultation with owner (Mr Okine) of washing bay By the First Culvert.

5.5 Summary of Key Environmental and Social Concerns from Stakeholder Consultations

The main environmental and social concerns raised during the stakeholder consultations are as follows:

i. Clarity on Project Duration

Majority of the PAPs consulted expressed concern about the suspension of construction works and wanted to know when the project will resume and the duration of the construction works.

ii. Temporary Displacement

Most sellers by the drain were concerned that they might be permanently displaced by the project. it was clarified that displacement is only temporary (Construction phase) after the project is completed they would be able to return to the site to continue with their business.

iii. Information on Valuation Criteria

Majority of PAPs sought clarification on the criteria for the valuation of affected properties as well as compensation for loss of livelihood.

5.6 Disclosure of ESMP

The World Bank (WB) requires that the ESMP be submitted for public disclosure purposes. The disclosure will take the form of in-country as well as infoshop disclosures.

5.6.1 In-country Disclosure Process

The PCU will submit copies of the ESMP to the Ghana office of the World Bank for clearance. The PCU will then ensure that copies of the cleared ESMP or its extracts (core report without annexes) are sent to the Municipal Assembly to enable the PAPs, and other stakeholders such as Assemblymen/women and NGOs access the document. A public notice of the ESMP disclosure will be placed at the Assembly premises and a publication in a national newspaper as well as local radio announcement also made to inform the public/PAPs about the documents at the Assembly.

Duration of in-country Disclosure

A maximum of 7 days (from date of public notification) would be allowed for receipt of public comments from the in-country disclosure.

Public response to in-country Disclosure

The PCU will collate feedback from the in-country disclosure and relay them to the consultant to be incorporated into the draft final ESMP.

5.6.2 Infoshop Disclosure

Copies of the Final ESMP will be submitted in electronic form to the Ghana office WB. The Ghana office WB will forward these to the WB infoshop in Washington for disclosure.

An Environmental and Social Management Framework (ESMF) was prepared for the GAMA Projects in December 2012 and it was approved by the World Bank and disclosed as part of the World Bank requirements at the World Bank Infoshop.

6.0 DESCRIPTION OF ENVIRONMENTAL AND SOCIAL IMPACTS

Field inspections and observations, concerns arising from stakeholder consultations and project description and designs formed the basis for the identified potential environmental issues and impacts likely to be associated with the proposed construction of Culverts at Dome-Kwabenya in the Ga East Municipal.

6.1 Project Area of Influence

The area of influence of the proposed drain construction at Dome-Kwabenya is described with respect to the following:

- Geographical Area of Influence;
- Physical Environmental Media Influence;
- Community Influence and Vulnerable Persons in the Institutions; and
- Institutional Influence.

6.1.1 Geographical Area of Influence

The immediate geographical area of influence for the proposed Culvert at Dome Kwabenya during the construction stage is the immediate environs of the Culverts, i.e. along the Taifa- Burkina Road. Precisely around the first culvert (5°40'0.82"N,0°14'22.22"W), Second culvert (5°40'0.78"N, 0°14'24.53"W) and third Culvert (5°40'0.80"N, 0°14'27.67"W)-which crosses the Taifa-Burkina Road. The larger geographical area of influence covers the Ga East Municipal of the Greater Accra Region of Ghana.

6.1.2 Physical Environmental Media Influence

The physical environmental media to be potentially influenced by the activities of the proposed project are land (landscape), air quality and groundwater the landscape features include soil, flora and fauna at the proposed project site which will be impacted by the project activities. Any adjacent drain to any of the project sites will be the recipient of runoff water from the project site. The air quality may also be impacted by dust and gaseous emissions from construction activities.

6.1.3 Community Influence, Vulnerable Persons and Institutions

The implementation of the proposed project could have an impact on the economic and socio-cultural conditions of nearby communities such as Taifa and generally for communities in the Odaw-Chemu-Korle basin. Most Residents living along the Taifa-Burkina Road will also be significantly influenced by the proposed project.

Vulnerable groups are those at risk of becoming disadvantaged and require special provisions in the project design. Vulnerable people include, but not limited to:

- disabled members of the community;
- very sick and or physically weak individuals; and
- Children.

6.1.4 Institutional Influence

The major institutions to be influenced or involved in the proposed project include:

- Ministry of Local Government and Rural Development;
- Ministry of Water Resources, Works and Housing, Works Directorate;
- Ministry of Water Resources, Works and Housing, Environmental Health and Sanitation Directorate;
- Hydrological Services Department (HSD);
- Ghana Health Services;
- Environmental Protection Agency;
- National Disaster Management Organization (NADMO);
- Department of Urban Roads;
- Ga East Municipal Assembly (GEMA);
    - Works Department;
    - Urban Roads Department (GEMA);
    - Municipal Physical Planning Department
    - Municipal Waste Management Department
- Town and Country Planning Department;
- Ghana Meteorological Agency;
- Centre for Remote Sensing and Geographic Information Systems (CERGIS);
- Regional Land Valuation Division of the Lands Commission, Accra; and
- Water Research Institute, Surface Water Division; and
- Royal house company Limited (Contractor).

6.2 Project Activities of Environmental and Social Concern

Activities of potential environmental and social impacts identified with the proposed project are outlined under four (4no.) main phases of the project activities; namely preparatory, construction, operations and maintenance and decommissioning phases.

6.2.1 Preparatory Phase Activities

Preparatory phase activities include among others:

- Assessment of catchment area (Ground topography and geomorphology, Drain location, underground obstructions, etc.) and environmental screening;
- Preparation of environmental and social screening reports; and
- Statutory permitting activities from EPA.

The preparatory phase activities had been completed prior to commencement of the preparation of the ESMP.

6.2.2 Construction Phase Activities

Construction phase activities include among others:

- Site clearance and removal of vegetation and obstacles within RoW;
- Transport of construction materials and equipment to and from site;
- Excavation of land and drain to remove concrete and debris using heavy duty equipment;

- Cutting of road (third culvert on the Taifa- Burkina road);
- Removal of existing box culverts on the roads and their reconstruction;
- Concrete works to line the drains;
- Road diversions; and
- Waste generation and disposal.

6.2.3 Operations and Maintenance Phase Activities

The main project works that will potentially create environmental and safety concerns during the operational stage include:

- Drain section maintenance activities
  - De-silting of choked sections
  - Repairs of damaged sections
  - Clearing of drain corridor of deposits and vegetation
- Silt trap/chambers maintenance activities
  - De-silting of chambers
  - Repairs of defects
- Culvert maintenance activities
  - De-silting of culvert cells
  - Repairs of structural defects.
- Flood management.

6.2.4 Decommissioning Phase

The Culvert structure is not expected to be decommissioned. Decommissioning issues under this project will occur after construction and will cover the following:

- Dismantling of temporary work camp of the contractor; and
- Waste management.

6.3 Criteria of Impact Evaluation

6.3.1 Duration of the Impact

- A temporary impact can last days, weeks or months, but must be associated to the notion of reversibility.
- A permanent impact is often irreversible. It is observed permanently or may last for a very long term.

6.3.2 Extent of the Impact

- The extent is regional if an impact on a component is felt over a vast territory or affects a large portion of its population.
- The extent is local if the impact is felt on a limited portion of the zone of study or by a small group of its population.

- The extent is site-specific if the impact is felt in a small and well defined space or by only some individuals.

6.3.3 Intensity of the Impact

- The intensity of an impact is qualified as strong when it is linked to very significant modifications of a component.
- An impact is considered of average intensity when it generates perceptible disturbance in the use of a component or of its characteristics, but not in a way to reduce them completely and irreversible.
- A weak intensity is associated with an impact generating only weak modifications to the component considered, without putting at risk some its utilization or its characteristics.

6.3.4 Impacts Severity

- Major Impact: An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Repercussions on the environment are very strong and cannot easily be reduced.
- Moderate Impact: An impact of moderate significance is within accepted limits and standards. Moderate impacts may cover a broad range, from a threshold below which the impact is minor, up to a level that might be just short of breaching an established (legal) limit. Repercussions on the environment are substantial but can be reduced through specific mitigation measures.
- Minor Impact: An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is of low sensitivity/value. Repercussions on the environment are significant but subdued and may or may not require the application of mitigation measures.

6.4 Evaluation of Potential Positive Impacts

The project will most likely offer employment opportunities for the locals during the construction phase. The contractor is expected to engage some local residents around the project sites as part of the expected workforce to be engaged for various aspects of construction activities, including excavation works, backfilling, construction of drains etc. This will provide employment for both skilled and unskilled youth in the area for the duration of the construction period. The provision of employment will keep the youth occupied and help focus their attention away from societal vices.

Local consultants will also potentially be contracted to carry out some activities during the planning and design stages, which will bring revenue to such local firms. Activities, which will require expert involvement, include preparation of the ESMP for environmental permit, carrying out hydrological investigations, right-of-way assessment etc.

For the proposed drainage improvement intervention, the following benefits which contribute to the overall improvement in the living standards of inhabitants in the catchment are expected:

1. Reduction of flooding and its consequent loss of property and lives;
2. Reduction health risks associated with poor discharge of grey water;

3. Prevention undermining of structures in the immediate environs of the drains;
4. Reduction health risks associated poor drainage in the areas;
5. Enhancement the economic use of land space that are mostly flooded perennially;
6. Contribute significantly towards improving the quality of life of residents in the immediate environs of the drains upon completion of the storm drainage and sanitation infrastructure.;and
7. The improvement of environmental conditions will affect livelihoods, as residents experience reduced sanitation-related health challenges such as reduced productivity and financial expenditure.

6.5 Evaluation of Potential Adverse Impacts Associated with the Proposed Project

The potential adverse impacts are evaluated with respect to the four phases stated above.

6.5.1 Evaluation of Potential Preparatory Phase Adverse Impacts

The potential significant environmental/social impacts associated with preparatory phase activities include:

- Land/wayleave Acquisition and compensation issues; and
- Occupational Health & Safety and Traffic/Public Safety Issues

The identified impacts are evaluated in **Table 6-1**.

Table 6-1: Evaluation of potential adverse preparatory phase impacts

No.	Impact	Key receptor(s)	Evaluation	Significance
1.	Land/wayleave Acquisition and compensation issues	Adjacent land users	Land/wayleave acquisition and compensation issues will arise from the drain construction. The names and contacts of affected persons are elaborated in the Abbreviated Resettlement Action Plan (ARAP) prepared for the project to effectively manage all issues on compensation for Project-Affected-Persons (PAPs) and to avoid conflicts to ensure unhindered execution of the project.	Major
2.	Occupational Health & Safety and Traffic/Public Safety Issues	Worker/ Public	The survey works (during the demarcation and erection of site pillars) may pose risk of injury or accident to the personnel involved. However, the implementation of standard safety practices by experienced personnel will curb their occurrence, even though the impact is of minor significance.	Modearte

6.5.2 Potential Adverse Construction Phase Impacts

The potential significant environmental/social issues associated with constructional phase activities include:

- Water Pollution/Soil Disturbance and Erosion and impact on aquatic life;
- Air quality deterioration;

- Vibration and noise nuisance;
- Visual intrusion;
- Generation and disposal of solid waste;
- Occupational health & safety;
- Public safety & health issues;
- Sanitation and public health; and
- Impact from influx of labour.

The identified impacts are evaluated in **Table 6-2**.

Table 6-2: Evaluation of potential adverse construction phase impacts

No.	Impact	Key receptor(s)	Evaluation	Significance
1.	Water Pollution/Soil Disturbance and Erosion	Soil, drains	Excavation works, vegetation clearance, levelling and other ground works will expose and loosen the soil making it susceptible to erosion. Transported soil from erosion may end up in downstream portions of the drain and lead to stagnation. The excavation and desilting of the drains may temporarily increase turbidity and suspendered particle levels in the drains. The construction activities can also reduce water quality by releasing pollutants trapped in bottom sediments or by dramatically reducing the amount of dissolved oxygen. Improper handling and storage of fuel at the construction site could also result in contamination of the soil by to oil/fuel spills. The impact is temporary lasting during the construction works. But can be managed through good construction practices.	Moderate
2.	Air quality deterioration	Ambient air environment, construction workers, community	Loading, haulage and dumping of sand/stone aggregates as well as cement handling will generate dust that can increase the air borne particulate in the vicinity. Other sources may be from clearing activities, spoil handling, and exhaust emissions from construction vehicles/machines traversing the untarred roads. Any windblown dust from the site may affect ambient air quality. Gaseous emissions and dust levels will be temporary, local in extent and average in intensity depending upon weather conditions.	Moderate
3.	Vibration and noise nuisance	Air, fauna, workers,	The operation of concrete mixing machines, movement of delivery trucks, tooting of horns of delivery trucks and carpentry works will generate noise and vibration. Typical noise level from construction activities range from 80dBA to 112dBA (BS 5228-1:2009) within the operational areas and is expected to significantly reduce by up to about 30dBA at a	Minor

No.	Impact	Key receptor(s)	Evaluation	Significance
			distance of about 50m from the site. The proposed drain is located along the Taifa-Burkina Road, and is generally commercial and heavily influenced by traffic noise, estimated at about 70dBA to 80dBA (BS 5228-1:2009) and will therefore not be significantly altered by the construction activities. The noise The impact from construction related noise will be intermittent, temporary and of local extent.	
4.	Visual intrusion	Landscape	The presence of construction workers, equipment/machinery and construction materials at the site will disrupt aesthetics and landscape character and may appear intrusive to the public, road users and pedestrians along the RoW. Poor housekeeping practices at the site may also reduce the aesthetic value of the area. This impact will be local and temporary.	Moderate
5.	Disruption of Utility Services and Damage Public infrastructure		Excavation works within the drain could also result in rupturing of service lines (water, electricity, telephone) which may be located within the RoW for the drains and temporarily interrupt service to the public. This would be a source of nuisance if not remedied promptly. Consultation with the Telecom providers, ECG and GWCL indicate that there are no lines along the location of the proposed project. The project also involves cutting across the Taifa- Burkina road, which will significantly disrupt transportation in the area if alternative routes are not provided.	
6.	Generation and disposal of solid waste	Soil, water bodies	Garbage removed from the drains during excavations will have to be properly disposed of. Excavated materials comprising in-situ earth materials as well as silted materials are likely to form the bulk of waste to be produced from the construction activities. Removal of vegetation in and along sections of the RoW will also have to be disposed of. Cement paper, used sachet water plastics, food wrappers and other domestic refuse from food vendors and hawkers (who may be selling to construction workers) will be generated at the workplaces. The impact is of local extent and temporary, lasting during the construction phase.	Major
7.	Occupational health & safety	Workers	Construction and excavation activities, movement of equipment, material handling and lifting, dust generation, open trenches/excavations poses a threat to worker safety at project site. Occupational health and safety issues associated with the proposed project construction include: • Exposure of workers to excessive noise, vibrations and	Major

No.	Impact	Key receptor(s)	Evaluation	Significance
			dust; • Accidents in the use and handling of equipment and machinery; • Injury to the body during the use and handling of equipment and machinery; and • Illness caused by exposure to wastes and odour. The extent of impact could be temporary or permanent.	
8.	Public safety issues	Public,	Movement of equipment and transportation of construction materials such as stone aggregates, cement, steel, sand etc. to the project sites may pose traffic safety concerns on the Taifa-Burkina road. Possible over speeding by construction vehicles and machines is a major concern due to its potential to cause accident on the roads and predispose the public, especially children, to accident risk. Any unattended mechanical breakdown of construction trucks and vehicles on the road can engender serious accidents. Public safety concerns may arise in cases, where local wooden footbridges are removed but yet to be replaced and residents try crossing the drain by jumping over. There could be risk of people falling into the drain channel. When Excavated waste materials are not managed properly, There is the potential for the pedestrian walkways along the construction site to be blocked with the excavated material causing Pedestrians to venture on to the main road leading to vehicular-pedestrian conflict at the site during construction phase.	Major
9.	Sanitation and public health	Land, water bodies, workers, public	The construction works could result in the interruption of flows in the drains and provide favourable conditions for breeding of mosquitoes and increased risk of water related diseases like cholera if not promptly resolved. In the event water supply lines are ruptured during construction, the leaks can reduce the pressure of the water system compromising its integrity and ability to protect water quality (by allowing contaminated water to be drawn into the system). Other key potential sanitation and public health issues that may arise from the proposed project include: • Indiscriminate disposal of waste such as polythene bags, used water sachet, food packages, may create unsightly	Major

No.	Impact	Key receptor(s)	Evaluation	Significance
			conditions. • free range defecation by some construction workers is also a public health concern.	
10.	Impact from labour influx	Dome Kwabenya Community	Generally, the influx of migrants to an area will greatly influence the security of the affected communities as migrants may not conform to the societal norms and cultural practices and may upset the social structure of these communities. The increased population will also put stress on the available resources such as drinking water, accommodation and even cause an increase in rent. Sexual Promiscuity is one of the main problems associated with influx of migrants to an area. Sexual harassment and other forms of gender-based violence, Sex with underage girls are factors that aggravate the spread of HIV/AIDS. The project is located in an urban area and cosmopolitan in nature. It is therefore devoid of the peculiar cultural characteristics more associated with rural communities in the country. The Dome Kwabenya culvert construction will not result in an influx of workers since it would require only about seventeen (17.No) workers at a time (as stated in **Section 2.5**). No work camps will be constructed on site to house workers and all the workers will commute from their respective homes to site and return to their homes after completion of their daily assignments, thereby reducing the probability of illicit sexual behavior as a result of the proposed project. A code of conduct will however be included to guide the behavior of workers on site as well as their relationship with the commuters and pedestrians.	Minor

6.5.3 Evaluation of Potential Operation/Maintenance Phase Adverse Impacts

The potential negative environmental impacts associated with operational and maintenance phase activities include the following:

- Waste disposal;
- Impact on geomorphology, hydrology and aquatic biota;
- Water quality deterioration;
- Public health and safety;
- Occupational health and safety; and
- Sustainability of the drains/risk of flooding.

The identified impacts are evaluated in **Table 6-3**.

Table 6-3: Potential impacts during Operation/Maintenance Phase

No.	Impact	Key receptor(s)	Evaluation	Significance
1.	Waste Disposal	Community	Due to the poor solid waste management practices in the communities and the city in general, drains are frequently choked with both silt and domestic waste, and periodic (e.g. annually) de-silting will be required to ensure proper functioning of the drain. Loose de-silted materials and waste collected from the drain channel and drain culverts during de-silting/maintenance activities may be deposited near the shoulder of the drain. If such loose desilted materials are not disposed of properly, they will be washed back into the drain in its loose form, and significantly increase turbidity and suspended solid content of the water bodies.	Major
2.	Impact on geomorphology, hydrology and aquatic biota	Aquatic biota/Dome Kwabenya Drain	The installation of culverts, to replace natural earth drains can alter stream hydrology and geomorphology as a result of plugging of the culvert, aggradation, and the associated high flow velocities. *Downstream* Culverts installed at an excessive gradient can create downstream erosion by increasing flow velocities and turbulence at the culvert outlet. This could contribute to the channel bottom scour that elevates the downstream end of the culvert, known as a perched culvert. The increased flow velocity at the outfall into the other drains result in degradation at the point of discharge through scouring. *Upstream* Culverts can cause sediment accumulation in the channel upstream of their position. Culverts that are undersized can be overtopped by high flows, resulting in erosion of the road surface and road fill. Many adverse geomorphological effects have resulted including plugging of the culvert, aggradation, and the high flow velocities which have contributed to the channel bottom scour that elevates the downstream end of the culvert *Biota* Changes in flow velocities and channel geomorphology may result in stream habitat alteration and adverse effects on	

No.	Impact	Key receptor(s)	Evaluation	Significance
			the stream biota. For instance, the increased stream velocities may exceed the swimming ability of small fish and prevent their upstream movement. Additionally, since the bed effects created by culverts end at the end of the structure, they could disconnect the upstream channel from the downstream channel for fish and other mobile aquatic species once the culvert becomes perched from the degradation caused by increased velocities and turbulence (Hendrickson, 1964). Riparian biota along the existing channel may also be lost as a result of replacement of the earth drain with a culvert.	
3.	Water Quality Deterioration	Surface water bodies	Drainage maintenance activities, including desilting, may temporarily increase turbidity and suspendered particle levels in the drains. The maintenance activities can also reduce water quality by releasing pollutants trapped in bottom sediments or by dramatically reducing the amount of dissolved oxygen. Sediment released during maintenance activities can disrupt downstream habitat by clogging gravels and filling in pools, side channels, and riffle areas that are necessary for spawning and the development of juvenile fish. The lubricant/fuel/oil requirement for the equipment, usually backhoe, used in carrying out de-silting works will have to be handled ad stored appropriate to prevent any oil spillage into drain.	Moderate
4.	Public health and safety	Public	Irregular maintenance of the proposed drains would result sediment and waste accumulation in the drains which may eventually restrict flow of the drain. Stagnant waters serve as a good breeding ground for mosquitoes and promote the spread of malaria. The inappropriate sanitation practices such as disposal of solid waste and dislodgement of human excrement into drains, coupled with stagnant drains could increase the risk of outbreak of water related diseases such as cholera and typhoid fever. Maintenance desilting/dredging of the drains could also result in rupturing of service lines (water, electricity, telephone) if they are not properly marked or relocated during the construction which may be located within the RoW for the drains and temporarily interrupt service to the public. In the case of water supply lines, leaks can reduce the pressure of the water system compromising its integrity and ability to protect water quality (by allowing	Major

No.	Impact	Key receptor(s)	Evaluation	Significance
			contaminated water to leak into the system). Uncovered drains could pose the risk of falling to and injury to passersby if the necessary precautions are not taken to safeguard the public.	
5.	Occupational Health and Safety	Workers	Backhoe excavators used for desilting drains are usually positioned very close to the drain during operation of the equipment. The engagement of inexperienced operator to carry out desilting of drain could result in accidents and injury to workers.	Moderate
6.	Sustainability of the drains/ Risk of Flooding	Public/ Government of Ghana	There is a high risk of accumulation of silt and solid waste in the proposed box drain since the upstream portions of the drain are open. The accumulation of silt and solid waste can alter the capacity of a box drain to convey water and increase upstream flooding by narrowing the volume of the drain. Therefore, while ostensibly created to facilitate flow of water and prevent flooding, the efficiency of the proposed drain could be compromised by the negative attitude of indiscriminate solid waste disposal.	Major

6.5.4 Evaluation of Potential Adverse Decommissioning Phase Impacts

The drainage facility is not expected to be decommissioned, because the river is a perennial natural water body that drains the area. Decommissioning will be associated with the contractor facilities after completion of construction works.

The potential negative environmental impacts associated with such decommissioning phase activities include the following:

- Occupational/public safety and traffic concerns; and
- Waste management and disposal.

The identified impacts are evaluated in **Table 6-4**.

Table 6-4: Potential Impacts during Decommissioning Phase

Potential Impacts	Description	Significance
Occupational/public safety and traffic	The relocation of all construction facilities and remaining materials including the concrete mixer, trucks, water tanks to new sites or to the head office for future works could result in accident and injury to workers. The removal and transport of such equipment and materials could also pose traffic risks and public safety concerns within the vicinity of the drain.	Moderate

	The duration of the impact is temporary and of local extent.	
Waste disposal	The dismantling and removal of work camp facilities, equipment and materials at the site could generate waste such as scraps metal, wood, concrete debris and garbage (pieces of plastic bags, food wrappers, etc.). The duration of the impact is temporary, the extent local and the severity minor.	Moderate

7.0 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN

7.1 Mitigation/Action Plan

Mitigation and management measures for the significant adverse impacts (rated as moderate or major) identified from the analysis and evaluation of the potential impacts from the proposed project activities are provided in **Table 7-1**.

Table 7-1: Mitigation measures/actions for potential significant adverse impacts

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GhȻ)
PLANNING/PREPARATORY PHASE					
1.	Land/wayleave Acquisition and compensation issues	• Excavation works	Compensation for affected properties • Consult affected property owners/users and seek their consent prior to commencement of construction works. • Ensure fair and adequate compensation is paid to all affected persons prior to commencement of construction activities.	Contractor/ Engineering Consultant	ARAP has been prepared
CONSTRUCTION PHASE					
1.	Water Pollution/ Soil Disturbance and Erosion	• Excavation works • Transport of construction materials • Cutting of roads • Concrete works to line the drains • Waste generated and disposal	• Works will not be executed under aggressive weather conditions such as rainy or stormy conditions. • No solid waste, fuels, or oils will be discharged into any section of the drain or waterway. • Construction will be done in sections to minimize impacts and exposure of soil. • Ensure that heaped sand delivered for construction works is covered with tarpaulin to prevent wind and water transport of soil particles • Excavated materials and soil, which cannot be used will be disposed of at sites approved by the GEMA Waste Management department. • Works on exposed trenches and earth materials will, as much as possible, be completed before new earth dug and trenches are created.	Contractor/ Engineering Consultant	Already captured in Bill of Quantities (BoQ)

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
			• Temporary sediment barriers will be installed on slopes to prevent silt from entering water courses. • Maintenance, fuelling and cleaning of vehicles and equipment to take place at off-site workshop with adequate leakage prevention measures		
2.	Air quality deterioration	• Excavation works • Transport of construction materials • Cutting of roads • Concrete works • Waste generated and disposal	• Soil/sand and cement loads in transit will be well covered to reduce dust levels rising above acceptable levels. • Stockpiles of exposed soil and unpaved access roads will be sprinkled with water to regulate dust levels. • Use of good quality fuel and lubricants in vehicles, equipment and machinery. • Engines of vehicles, machinery, and other equipment will be switched off when not in use. • Regular scheduled maintenance and servicing will be carried out on all vehicles and equipment to minimise exhaust emissions. • Construction and civil works will be phased out or controlled to reduce emissions from equipment and machinery in use. • There will be constant watering of dusty diversion roads to reduce the amount of dust particles when cars use them.	Contractor/ Engineering Consultant	Already captured in BoQ
3.	Vibration and noise nuisance	• Excavation works • Transport of construction materials • Cutting of roads • Concrete works • Waste generated and disposal	• Excavation and construction activities will be carried out during daylight hours. • Concrete mixer and other construction machines and equipment will be located away from sensitive environmental receptors. • Construction equipment and machinery will be regularly maintained and serviced to reduce noise generation when in use. • Engines of vehicles, equipment and machinery will be turned off when not in use. • Earthworks and other construction activities will be phased out or controlled to reduce noise generation during construction.	Contractor/ Engineering Consultant	Already captured in BoQ

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
4.	Visual intrusion	• All construction phase activities	• Construction activities will be done in sections to reduce impacts of change and visual intrusions to the general public. • The construction sites will be hoarded off from public view. • Good housekeeping measures, such as regular cleaning, will be maintained at the construction site. • Ensure an acceptable post-construction site as per provisions in the contract.	Contractor/ Engineering Consultant	Already captured in BoQ
5.	Disruption of Utility Services and Damage to Public infrastructure.	• Cutting of roads • Drain excavation works	• Collaborate with the Municipal Works and Urban Roads departments to ensure that the highest standards are implemented for the road cutting and reinstatement. • Consult with utility providers to confirm location of their respective assets (pipelines, cables) within the project corridor to prevent blind encroachment • Collaborate with the engineers of the utility providers (GWCL/ ECG/Telecommunication providers) to ensure the most appropriate measures are taken to safeguard the integrity of the pipelines/cables. Measures to be implemented include: o Avoiding the encroachment on the pipelines or cables o Inform the utility providers and the GEMA of any damaged pipeline or cable o Promptly repair any damaged pipelines or cables o Relocation of pipelines or cables to safe	Contractor/ Engineering Consultant	Already captured in BoQ
6.	Generation and disposal of solid waste	• All construction activities	Apply the principles of Reduce, Recycle, Reuse and Recover for waste management through the following actions: • Excavated earth materials will, as much as possible, be re-used for back filling purposes to reduce waste • Excavated solid waste from the drain channel that are unsuitable for backfilling will be collected onsite, allowed to drain and collected for disposal at sites approved sites in collaboration by the GEMA.	Contractor/ Engineering Consultant	Already captured in BoQ

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
			• Ensure that the required amounts of construction materials are delivered to site to reduce the possibility of the occurrence of excess material • Provide bins on site for temporary storage of garbage such as lubricant containers, drinking water sachets and carrier bags/packaging materials. • Ensure judicious use of construction materials such as pipes, laterites, sand, etc. to reduce waste • All metal scrap waste will be disposed of at sites approved by the GEMA or sold to approved third party agents for use by metal companies. • Contractor to work according to a prepared and agreed Solid Waste Management Plan.		
7.	Occupational health and safety (OHS) issues	• All construction activities	• Engage experienced artisans for construction works. • All workers should be given proper induction/orientation on safety. • The contractors will have a Health & Safety Policy and procedures to guide the construction activities. • Regularly service all equipment and machinery to ensure they are in good working condition. • Ensure there are first aid kits on site and a trained person to administer first aid. • Provide and enforce the use of appropriate personal protective equipment (PPE) such as safety boots, reflective jackets, hard hats, hand gloves, earplugs, nose masks, etc. • Proof of competence for all equipment/machine operators will be required and established through inspection of valid drivers or operator's license or documents.	Contractor/ Engineering Consultant	Already captured in BoQ
			• Comply with all site rules and regulations. • Apply sanctions where safety procedures are not adhered to. • Site meetings should create awareness on OHS.	Contractor/ Engineering Consultant	

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
8.	Public safety and traffic issues	• All construction phase activities	• Hoard off the construction sites to prevent access by unauthorised persons. • The culverts will not be constructed simultaneously, they will be constructed one after the other so as to prevent a complete blockage of access roads to homes and shops. When the Third culvert is being constructed, there would be a possible rerouting. (see **ANNEX 3**) • Transport of materials to the site will not be done during peak traffic hours • Warning signs and notices will be placed at all dangerous sites, including open trenches meant for culvert construction. • Provide adequate signage to warn motorists of blockage due to culvert construction. • Transport of materials to the site will not be done during peak traffic hours between 7am to 9am and 4pm to 6pm. • Speed limit for all vehicles and construction equipment should be less than 20km/h within the drain construction corridor. • Ensure delivery trucks hired/contracted are in good condition to prevent breakdowns on roads. • Provide foot bridges at appropriate locations in consultation with the Assembly member to assist the public to safely cross the drains. The fottbridges should be strong, child friendly and fitted with hand rails to prevent people falling over or the footbridge collapsing.	Contractor/ Engineering Consultant	Already captured in BoQ

9.	Sanitation and public health impacts	• All construction phase activities	• As a policy, open defecation is prohibited, and any construction worker found violating this policy will be sacked.
			• Provide waste bins at project site to minimise littering of the site, and final disposal of waste will be done at the GEMA approved waste dump sites only.
			• Ensure the availability of toilet facilities for use by construction workers.
			  ○ provide mobile toilet facilities, which must be regularly maintained and cleaned.
			  ○ Arrange for the possibility of using public toilets
			• Food vendors and hawkers will be sensitized to use the public toilet facilities in the vicinity of the project area to prevent open defecation.
				Contractor/ Engineering Consultant	Already captured in BoQ

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
			• Drain off all trenches or excavations made during the construction to avoid the occurrence of stagnant water • Potable water in filtered water sachets from certified sources will be made available at workplaces as workers' drinking water.		
10.	Impact from the Influx of Labour	• Beneficiary communities	• Workers will be made aware of the Code of Conduct at Induction, weekly safety meetings and Project monthly meetings. • Contractor will ensure all workers comply with the Code of Conduct on site • Appropriate punitive measure will be applied in the event of any misbehaviour by workers on site. • Open communication channels will be maintained through the grievance redress mechanism to enable the community members report on any misbehaviour by workers.	Contractor/ Engineering Consultant	Already captured in BoQ
OPERATIONAL AND MAINTENANCE PHASE					
1.	Waste generation and disposal	• Desilting/maintenance of drains	• Waste management Department of the GEMA to provide and implement a schedule for the maintenance and desilting of all drains within their jurisdiction • Silt and waste from the desilting/maintenance of drains should be promptly removed from the drain corridor to prevent them from being washed back into drain by runoff and also prevent nuisance to motorists and pedestrians. • Segregate waste from maintenance/desilting of drains (i.e. separate sand/silt materials from garbage), • Make available sand/silt materials obtained from desilting of drain to interested local communities and private individuals for their private projects. • Identify land requiring reclamation and send any excess silt materials to such places instead of to landfill sites. • Dispose of plastic and other garbage from maintenance and desilting activities at approved dump sites if it cannot be reused. • Ensure that Waste bins/Skips supplied to the communities are emptied on a	Contractor/ GEMA Municipal Environmental Health and Management Department/ Waste management institution contracted by GEMA.	2,000.00

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
			regular basis.		
2.	Impact on geomorphology, hydrology and aquatic biota	• Operation of the drain • Desilting/maintenance of drains	● Provide for a spillway into a pool at the end of each culvert outlet to reduce velocities, dissipate energy and eliminate perching. ● Ensure prompt removal of debris from the catch pits, inlet and outlet of the culvert. ● Ensure prompt removal piles of soil and desilted materials left along drain corridor during drain maintenance/desiliting	Contractor/ Municipal Environmental Health and Management Department	No Additional cost aside from BOQ.
3.	Water Quality Deterioration	• Desilting/maintenance of drains	● Maintain vegetation along the drain corridor to retard erosion ● Ensure that contractors do not dispose of any waste oil, or refuse into the drain. ● Ensure prompt removal piles of soil and desilted materials left along drain corridor during drain maintenance/desilting ● Conduct public education and awareness campaigns on the impacts of inappropriate sanitation practices such as disposal of solid waste and dislodgement of human excrement into drains.	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department	3,000.00
4.	Public health and safety impacts	• Desilting/maintenance of drains	● No free range defecation will be allowed within the drain corridor during maintenance for desilting works. ● Keep record of the location all water pipelines in the drain RoW Identified and marked during construction to prevent rupturing during maintenance. ● Ensure that clear signages are provided for uncovered drain	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department	1,000.00

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
5.	Occupational Health and Safety		• Engage experienced artisans for maintenance works. • All workers should be given proper induction/orientation on safety. • Ensure contractor have a Health & Safety Policy and procedures to guide the construction activities. • Ensure there are first aid kits on site and a trained person to administer first aid. • Provide and enforce the use of appropriate personal protective equipment (PPE) such as safety boots, reflective jackets, hard hats, hand gloves, earplugs, nose masks, etc. • Proof of competence for all equipment/machine operators will be required and established through inspection of valid drivers or operator's license or documents.	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department	1,500.00
6.	Sustainability of the drains/ Risk of Flooding	Operation and maintenance of the drain	• Conduct public education and awareness campaigns on the impacts of inappropriate sanitation practices such as disposal of solid waste and dislodgement of human excrement into drains. • Sensitise the public to ensure all solid waste and silt are removed from the public drains on the national sanitation day (first Saturday of each month). • Develop and implement a monitoring and maintenance regime for the drains.	GEMA Municipal Works Department/ Municipal Environmental Health and Management Department	2,000.00
DECOMMISSIONING PHASE					
1.	Occupational/public safety and traffic	• Dismantling and relocation of equipment and work camps	The contractor will be required to ensure that: • Personal protective gear are provided to workers involved with decommissioning of facilities and camp. • Toilet facilities are available throughout the decommissioning period. • Workers still have access to public toilet facilities in the communities or can be conveyed to such facilities where needed, if mobile toilet facilities have been relocated. • Final movement of its vehicles and equipment comply with approved speed	Contractor/ Engineering Consultant	Already captured in BoQ

No.	Identified Impact	Project Activities	Proposed Mitigation Measures/Actions	Responsibility	Annual Cost Estimates (GH₵)
			limits within the communities. • All community complaints are resolved before handing over drain project.		
2.	Waste disposal	• Dismantling and relocation of equipment and work camps	• Ensure that all waste streams created during construction of the drain are collected from work sites and properly disposed of before handing over the project. • Inspect the site to ensure that the contractor has properly cleaned up all construction sites before final payment is made to the contractor.	Contractor/ Engineering Consultant	Already captured in BoQ
	SUB TOTAL				**9,500.00**

7.2 Environmental And Social Monitoring Plan and Reporting

7.2.1 Environmental and Social Monitoring Plan

The environmental and social monitoring plan proposed for the implementation of the ESMP for the Dome-Kwabenya Culvert is presented in **Table 7-2.**

Table 7-2: Environmental and Social Monitoring Plan

No.	Environmental/ Social Component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)	Cost Estimate/ Year (GH¢)
PPREPARATORY/ PLANNING PHASE						
1.	Land/wayleave Acquisition and compensation issues	- evidence of compensation payment - evidence of reinstatement of affected property	Drain corridor	Monthly. After valuation	MLGRD	-Cost to be Determined by ARAP.
CONSTRUCTION PHASE						
2.	Water Pollution/Soil Disturbance and Erosion	- Observable change in turbidity of water - Observable oil sheen - presence of stagnant water	Drain	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
3.	Air quality/ Noise	-observation of air borne particulates (dust) and exhaust fumes -complaints on noise nuisance from community	-Construction site -Immediate environs	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
4.	Visual intrusion	Hoarding in place	-Construction site -Immediate environs	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
5.	Disruption of Utility Services and Damage Public infrastructure	- Indicators and record of the location of utility service lines - Evidence of consultations with	Construction site	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ

No.	Environmental/ Social Component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)	Cost Estimate/ Year (GH₵)
		service providers - Record of affected service and action taken				
6.	Waste Management	- Availability and use of bins - Records on frequency and location of waste disposal site of domestic and construction waste	Construction site	Daily	Contractor/ Engineering Consultant/Waste Institution contracted by GEMA.	No additional cost required aside BoQ
7.	Occupational health and safety	- Availability and proper use of PPEs - Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury - Records on non-compliances	Construction site	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
8.	Public safety and traffic issues	- Hoarding of project site - Records on frequency, type and source of accident/injury - Warning signs and notices in place - Schedule for transport of materials - Child friendly, safe and strong footbridges at right places.	Construction site	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
9.	Sanitation and public health impacts	- mobile toilet facilities in place - presence of stagnant water in drains - availability of potable water to worker	Construction site	Daily	Contractor/ Engineering Consultant	No additional cost required aside BoQ
10.	Impact from the	- Workers provided with a copy of the	Construction site	Daily	Contractor/	No additional cost

No.	Environmental/ Social Component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)	Cost Estimate/ Year (GH₵)
	influx of Labour	code of conduct for site -			Engineering Consultant	required aside BoQ
11.	Public Complaints/ Grievances	- Type and nature of complaints and concerns; - Complaint records (Record of grievance and number resolved/unresolved) - Management and Stakeholder Meetings	Project community	Weekly	Contractor/ Engineering Consultant/	No additional cost required aside BoQ
OPERATIONAL PHASE						
6.	Waste generation and disposal	- Drain desilting schedule developed - Records of inspection and desilting of drains - Options for reuse of collected silt	Drain corridor	-Monthly	Contractor/ GEMA Works Department/ Waste Management Institution contracted by GEMA.	500.00
7.	Impact on geomorphology, hydrology and aquatic biota	- spillway at the outlet of culvert in place - occurrence of culvert perching - presence of waste in catch basins, inlet of culvert and outlet of culvert	Culvert outlet Culvert outlet	Monthly Weekly	Municipal Works Department/ Municipal Waste Management Department	800.00
8.	Water Quality Deterioration	- vegetation along the drain corridor maintained - presence of desilted material on drain corridor	Drain corridor	-Monthly	Contractor/ GEMA Works Department	1,500.00
9.	Public health and safety impacts	- Availability of signages for uncovered drain	Drain corridor/ Community	Monthly	Contractor/ GEMA Works Department	800.00

No.	Environmental/ Social Component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)	Cost Estimate/ Year (GH₵)
		- Complaint records (Record of grievance and number resolved/unresolved)		Weekly		
10.	Occupational Health and Safety	- Availability and proper use of PPEs - Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury - Records on non-compliances	Drain corridor	-Daily	Contractor/ GEMA Works Department	1,500.00
11.	Sustainability of the drains/ Risk of Flooding	- Availability of schedule and plan awareness creation and sensitisation - Record of awareness creation and sensitization activities carried out - Monitoring and maintenance regime for the drains developed	GEMA/ Community	Monthly	Contractor/ GEMA Works Department	1,000.00
DECOMMISSIONING PHASE						
1.	Occupational/public safety and traffic	- Availability and proper use of PPEs - Adherence to health and safety procedures - Records on frequency, type and source of illness/accident/injury	Drain corridor	-Daily	Contractor/ GEMA Works Department	- No additional cost required aside BoQ
2.	Waste disposal	- Availability and use of bins - Records on frequency and location of waste disposal site of domestic and construction waste	Drain corridor	Daily	Contractor/ Engineering Consultant/Waste Management	- No additional cost required aside BoQ

No.	Environmental/ Social Component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility (Implementation/ Supervision)	Cost Estimate/ Year (GH₵)
					Institution contracted by GEMA.	
SUB TOTAL:						**6,100.00**
TOTAL						**73,200 per year for Dome Kwabenya.**

7.2.2 Environmental and Social Monitoring Reporting

Environmental monitoring is an essential component to ensure the successful implementation of the ESMP. A report on the monitoring programme will provide the contractor and the MLGRD with relevant data and information to better understand the extent of implementation of the ESMP. All monthly and progress reports should capture health, safety and environment issues arising from the implementation of the ESMP.

The ESMP monitoring report requires the implementing body to specify evidence of completion for each mitigation measure (e.g. a document that proves the completion of the measure or a short description of the expected achievement or pictures). If implementation is ongoing, the status of implementation should be described. The monitoring report concludes by summarising the main findings and by indicating the overall status of ESMP implementation using a three-point ranking scale: on track (green), slightly delayed (yellow) or delayed (red). Opportunity is provided for indicating any additional environmental or social risks that may have emerged since the project start and the appropriate mitigation measures taken or planned for any significant new risk.

7.3 Grievance Redress Process

Grievance redress mechanism (GRM) is the institutions, instruments, methods, and processes by which a resolution to a grievance is sought and provided. The consultations of project affected persons and other key stakeholders will ensure that their concerns are taken care of during project implementation and would help minimize disputes or conflicts arising from implementation of any project activity. Nevertheless, avenues have been created for project affected persons to express a grievance against any resettlement or compensation related issue or procedures, or directly against improper construction activities.

7.3.1 Objective and Purpose of the Grievance Redress Mechanism

The objective or purpose of the Grievance Redress Procedure is to address and resolve grievances or complaints from affected persons promptly, fairly, and in a manner that is, to the extent possible, acceptable to all parties. It is intended to use alternative ways to resolve complaints/disputes/conflicts arising out of the implementation of the ARAP in an amicable way and to avoid or minimise litigation.

7.3.2 Potential grievances/disputes

Potential issues of grievances and disputes envisaged during the project implementation are expected to be related to the following:

- Disruption of local transportation and business along RoW;
- Destruction of property along RoW;
- Identification and enumeration of project affected persons;
- Noise generation;
- Dust dispersal;
- Poor housekeeping at the project site; and

- Improper behaviour by the workers towards community members (commuters and pedestrians).

7.3.3 Redress Mechanism

The general steps of the grievance process comprise:

- Registration of complaints;
- Determining and implementing the redress action;
- Verifying the redress action; and
- Monitoring and Evaluation.

Registration of complaints

Complaints can be lodged verbally or in writing or phone call to the GAMA Project Coordinator at the Municipal Assembly. The elected local Assemblyman for the area can also receive complaints from PAPs (because the Assemblyman lives within the community and may be closer to the PAPs and some PAPs prefer to route their complaints through the Assemblyman and avoid undue transport and time cost to the Assembly) and ensure that such complaints reach the GAMA Project Coordinator at the Assembly. The GAMA Project Coordinator shall receive all complaints and shall officially log these complaints in a dedicated log book for that purpose. The GAMA Project Coordinator will inform the team leader for the grievance redress committee within 24 hours on any complaint lodged.

Determining and implementing the redress action

When a grievance/dispute is recorded as per above-mentioned registration procedures, the grievance redress team will be called into action, and mediation meetings will be organized with interested parties. Minutes of meetings will be recorded.

The grievance redress team will determine the redress action in consultation with the complainant if necessary. The proposed redress action and the timeframe in which it is to be implemented will be discussed within 3 working days of receipt of the grievance. The grievance issue will be resolved within 5 working days of receipt of complaints.

Verifying the redress action

The grievance redress team will visit the affected property site or get in touch with the complainant to confirm that the redress action is carried out. If the complainant is not satisfied with the outcome of the redress action, additional steps will be taken to resolve the issue or reach an amicable agreement. Verification will be completed within 7 days of the execution of the redress action.

Monitoring and Evaluation

The Monitoring and Evaluation Team will monitor the activities of the Grievance Redress Team to ensure that complaints and grievances lodged by PAPs are followed-up and resolved amicably as much as possible.

7.3.4 Membership and Function of Grievance Redress Team/Committee

The Grievance Redress Committee/Team will include the following:

- Alhaji Shegu Kabiri, the Municipal Coordinating Director (0206589915), will chair the Committee;
- Mr Derick Tata Anku, the GEMA GAMA Project Coordinator (0244016563);
- Hon. Nana Sarfo Gyasi, the elected local Assemblyman (0277769760); and
- Mr. Nii Okiine, a representative of the PAPs (0541970000).

In addition to the main function of resolving grievances, disputes, complaints and conflicts, the Grievance Redress Team will:

i. ensure smooth implementation of the ESMP;
ii. establish dialogue with the PAPs; and
iii. Ensure that their concerns and suggestions are incorporated and implemented during the construction phase.

7.3.5 Additional Steps and Court of Law

If the complainant is not satisfied with the decision of the grievance redress team, he/she can bring it to the attention of the Chief Director at the Ministry of Local Government and Rural Development, or the GAMA PCU Coordinator will draw the attention of the Chief Director at the MLGRD about the unresolved grievance. The Chief Director at the Ministry will mediate on the issue within 5 days from the date of receipt of such a decision by the Ministry. If such a timeline is not possible, the Chief Director should inform the PCU accordingly giving reasons and possible new date.

If the complainant remains dissatisfied with the mediation effort of the Ministry, the complainant has the option to pursue appropriate recourse via judicial process in Ghana. The Constitution allows any aggrieved person the right of access to Court of law. However, noting that court cases can be cumbersome and time consuming, all effort must be made to reach amicable settlement with the affected person(s).

7.3.6 Cost for Grievance Redress Activities

A lump sum of Ghc5, 000.00 has been estimated to take care of the activities of the Grievance Redress Team.

7.4 Capacity Building For Implementation Of ESMP And Permit Conditions

Training Workshop will be organized to guide the implementation of the ESMP, Permit Schedule, Triggered World Bank Safeguards Policy and environmental management. The training on the ESMP implementations will include the Code of conduct for contractor and his/her labour force, public health and safety issues, Grievance Redress Mechanism for the project, ESMP monitoring and reporting.

7.4.1 Objectives of the training

The main objective of the capacity building and training activities is to create, enhance and develop the necessary skills and abilities for successful implementation of the proposed project.

7.4.2 Methodology for the training:

The methodology to implement the training will include:

- Workshops and site meetings;
- Sensitization for the community with the help of the Municipal Assembly and Assembly members.

It is recommended that the site meetings discuss the ESMP issues and any health and safety issues identified in the course of the month. Non-compliances identified during monitoring should reviewed and corrective actions taken. A capacity building measure proposed to achieve this is provided in **Table 7-3.**

Table7-3: Capacity building plan for implementation of ESMP and Permit Conditions

No.	Activity	Target Group/Participants	Timeline/Duration	Proposed Facilitator	Cost GHC
Construction Phase					
1.	Training Workshop on ESMP, Permit Schedule, Triggered World Bank Safeguards Policy	Weruw Consulting, -Resident Engineer Royal House Company Ltd -Manager -Foreman GEMA -Waste Management Department -Planning Department -Sewage Unit	Prior to resumption/ commencement of construction works	Municipal Assembly/ Safeguards Specialist/ Consultant	15,000.00
2.	Induction on health& safety and environmental management	All construction workers	Prior to commencement of construction works	Royal House Company Ltd / Weruw Consulting	8,000.00
3.	Project monthly meetings (review of environmental monitoring plan and	Weruw Consulting, Royal House Company Ltd and Representatives of GEMA	During construction period	Weruw Consulting/ GEMA Works Department	12,000.00

No.	Activity	Target Group/Participants	Timeline/Duration	Proposed Facilitator	Cost GHC
	report)				
Operational Phase					
4.	Training for use and management of the culverts	Municipal Works Department/ Municipal Environmental Health and Waste Management Department	Prior to commissioning and handing over	-Engineering Consultant -GAMA Coordinator -Municipal Works Engineer/ Municipal Waste Officer	10,000.00
5.	Sensitization and awareness creation on waste disposal and maintenance of drains	General Public	Throughout operation of drains	Municipal Waste Management Department	As part of duties of Municipal Waste Management Department
TOTAL					**35,000.00**

7.4.3 Output of the Training

Capacity building on the health, safety, environmental and social management measures provided in this chapter is required to ensure the effective implementation of the ESMP and the permit conditions. All monthly and progress reports should capture health, safety and environment capacity building activities carried out.

7.5 Estimated Budget for ESMP Implementation.

The environmental and social management actions described above require detailed cost analysis after project development to determine the budget needed for implementation. It is estimated that an amount of **One Hundred and Twenty Two Thousand, Seven Hundred Ghana Cedis (GH¢122,700.00)** will be required to implement the provisions of the ESMP for the Dome Kwabenya Culvert construction in the GEMA as shown in **Table 7-4**. This figure is subject to review following confirmation from cost studies to be carried out after project development phase.

Table 7-4: ESMP Budget.

No.	Programme	Cost/year(GH₵)
1.	Mitigation Action for Identified Impacts (**Table 7-1**) (9,500 a month)	9,500.00
2.	Environmental And Social Monitoring Plan (**Table 7-2**)(6,100 a month)	73,200.00
3.	Grievance Redress	5,000.00
4.	Capacity Building(**Table 7-3**)	35,000.00
Total		**122,700.00**

7.6 Reinstatement and resettlement issues

For those property and livelihoods that the project implementation will affect requiring resettlement and reinstatement, an Abbreviated Resettlement Action Plan (ARAP) has been prepared to address them.

8.0 CONCLUSION

GEMA and the Project Coordinating Unit of MLGRD is committed to ensuring sustainable environmental management and safeguarding the health and safety of the construction workers and the general public during the implementation of the proposed project. The Project Coordinating Unit is also aware of the provisions in the Environmental Assessment Regulations 1999, LI 1652 and the World Bank Operational Policies. In keeping with these laws, this ESMP has identified and assessed key environmental and social impacts and concerns that may arise from the implementation of the proposed project.

Consultations with stakeholders, review of relevant literature, field inspections and studies underpinned the identification of the project adverse environmental and social impacts. A monitoring programme to help detect changes arising from the predicted adverse impacts has also been presented in this ESMP. The recommendations outlined in the ESMP for the project will ensure a high level of health, safety and environmental management for the proposed project.

It is estimated that the implementation of the ESMP in the Ga Municipal Assembly cost about **GH¢122,700.00**. The proposed project has the potential to provide numerous short and long-term benefits in the Ga East Municipality and the national economy. These include control of flooding, reduced malaria occurrence, improved sanitation, hygiene and waste management within the Dome Kwabenya community and the Odaw basin as a whole.

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ANNEX 1: STAKEHOLDER CONSULTATIONS

EVIDENCE OF STAKEHOLDER CONSULTATION

Stakeholders consulted at Dome Drain culvert site

No	Persons Consulted	Telephone number
1.	Matthew Amponsah	0242366779
2.	Faustina Afriye	0236505155
3.	Gloria Daakpe	0242323602
4.	Beatrice Atwibanfo	0278527662
5.	Florence Kwarteng	0244737636
6.	Bernice Asare	
7.	Maame Grace Oppong	0571369900
8.	Fuseina Issah	0546859080
9.	Ummu Issah	0278888171
10.	Godson Hattoh	
11.	Tina Aklaku	0208821790
12.	Sophia Koney	0241439362
13.	Nana Kwabena Daabuo Tawiah	0240605563
14.	Esther Kafui Dzansi	0245798854
15.	Emelia Asante	0245737890
16.	Daniel Kyeremanteng	0244376122/0236130309
17.	Fidaus Sai	0273453506
18.	Frank Asare	0243213316
19.	Seth Owusu Abrebrese	
20.	Oforiwaa Cynthia	0545289152
21.	Joyce Kwabea	0246310438
22.	Alice Takyi	0261424313
23.	Matthew Kwame	0265950189
24.	Georgina Agbedanu	0242358605
25.	Sadia Yakubu	0245627734
26.	Charles Nelson	0237111333
27.	Aboagye Richard	0273291643
28.	Linda Enstie	0554772610
29.	Dora Oforiwaa	0574833971
30.	Nhyira Mmoroso Washing bay 1. Owner(Nii Okine) 2. Isaac Dadzie 3. Akrofi Isaac 4. Kwaku Alex Sogah 5. Kwaku Owusu 6. Kwesi Ibrahim 7. Micheal Addo 8. Yaw Mensah 9. Wisdom	 1. 0541970000 2. 0262142350 3. 0268475517 4. 0247529756 5. 0264591106 6. 0268989700 7. 0541091050 8. 0266740775 9. 0245879679

	10. Abraham 11. Lydia Asante	10. 0265769906 11. 0244635879
31.	Taifa-Burkina Coop Taxi Rank 1. Stephen Kobina (President) 2. Abraham Ajapong (Vice President) 3. Morgan Duah (Discipline) 4. Seth Smith (Welfare) 5. Emmanuel Donkor (Assistant Welfare) Other Members 1. Nelson Aziaga 2. Kodjo Godo 3. Kweku Oppong 4. Ebenezer Sackey 5. Stephen Nana Kwame Boadi 6. Stephen Narh 7. Collins Boakye 8. Kofi Aboagye	 1. 0207706970 2. 0278271919 3. 0277301739 4. 0275987599 5. 0243721229 1. 0242354026 2. 0274128449 3. 0240496800 4. 0546136095 5. 0272503050 6. 0266258487 7. 0268121247 8. 0547208055

INSTITUTIONS, CONSULTANTS, CONTRACTORS CONSULTED

Stakeholder	**Contact Person**	**Role**	**Contact number**
Ministry of Local Government and Rural Development/ Project Coordinating	George Awudi	Safeguard Specialist	0506152780
GEMA	a. Mr Derick Tata- Anku b. Mr. Justin Tsogbe Glover	**a.** GAMA Project Coordinator (GEMA)/ Municipal Environmental Health officer **b.** GEMA Works Engineer	a. 0204300105/0267209911 b. 0202409797
Weruw Consulting Engineering	a. Mr. Wise Ametefe b. Felix Selanase Tsinase	a. Consulting Engineer b. Project Engineer.	a. 0244384254 b. 024467794
Royal House Company Limited.	a. Alex Boadi b. Elvis K Ezor c. Emmanuel Mai	a. Manager b. Resident Engineer c. Clerk of Works	a. 0207564495 b. 0234982947 c. 0246635784
Assembly Members.	a. Mr. Nana Sarfo Gyasi	a. Assembly Man for	a. 0277769760

	b. Mr. Okine.(Walle)	Dome Taifa. b. Assembly Man for Dome North	b. 0248913195/0277477939
Electricity Company of Ghana	a. Mr James Teye, Project Engineer Accra West. b. Nat Fleischer, Principal Drafts Man Accra west c. Mawuli Sallah, Electrical Engineer/ Project supervisor Accra West d. Gabriel Narteh, Electrical Contractor.	Service Providers/ RoW user	a. 0243438027 b. 0244125789 c. 0244992903 d. 0200263936
Ghana Water Company Limited	Engineer Francis Lamptey	Service Providers/ RoW user	0205221912
National Communications Authority	Edward Sunderland, Officer (Engineering)	Telecom regulator	0574497157
Taifa—Burkina Co-op Taxi Rank	Stephen Kobbinah	(President)-	0207706970
	Abraham Agyapong	(Vice President)-	0277301739
	Morgan Duah	(Discipline)-	0275987599
	Seth Smith	(Welfare)-	0243721229
	Emmanuel Donkor	(Welfare Assitant)-	0275992320

Attendance at Stakeholder Meeting held between NCA, Weruw Consulting Engineering, SAL Consult Ltd, and owners of Fibre Optic Cable Infrastructure on March 22nd And 29th , 2017 at NCA Head Office (5th Floor)

No.	Name	Organization	E-mail	Contact
1.	Edmund Fianko	NCA	edmund.fianko@nca.org.gh	
2.	Edward Sutherland	NCA	edward.sutherland@nca.org.gh	0574497157
3.	Emmanuel Acquah	SAL Consult Ltd.	eacquah@gmail.com	0277114700
4.	Nana Otu Ansah	SAL Consult Ltd.	nyotuansah@salconsultgh.com	0277867831
5.	Goerge Awudi	MLGRD- PCU	gawudi@lgpcu.org	0545231324
6.	William M. Asare	Vodafone	william.asare@vodafone.com	0202003957
7.	Kwame A. Yeboah	C – Squared	kwamey@google.com	0249948004
8.	Ajayi Olusole	Glo	olusok.ajayi@glomobile.com	0230557419
9.	Charles Amoako	MTN/ Huawei	charles.amoako@huawei.com	0245953961
10.	Kow E. Neizer	MTN	kow.neizer@mtn.com	0244303399
11.	Benjamin K.E. Fynn	Airtel	BenjaminFynn@gh.airtel.com	0266000814
12.	Tony Quaye	Airtel	tonyquaye@gh.airtel.com	0266000902
13.	Goerge Akrofi Yirenkyi	Airtel/ Huawei	Georgeakrofiyirenkyi@huawei.com	0207975717
14.	Ing. Wise Ametefe	Weruw Consulting Engineering	ametefewise@gmail.com	0244384254
15.	Slyvester D. Opoku	Comsys Ghana	sylvester.opoku@comsysghana.com	0243612746
16.	Ethan Quaye	Comsys Ghana	ethanquaye@comsysghana.com	0571388976

Plate 3:Metallic container on the right of way of construction

Plate 4: Consultation with owners shops at project site

Plate 5: nearby washing bay


Plate 4&5: Consultants engaging a worker (Left) and owner (Right) at the washing bay


Plate 6 & 7 :Consultant engaging with people in the project area

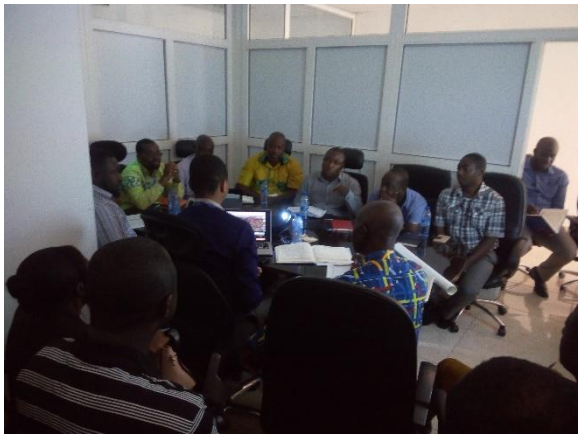

Plate 8 & 9 A local resident and shop owner engaging with Consultants.


Plate 10 & 11 Mrs Comfort Kotey(Left) and Seth Owusu Abrebrese(right)

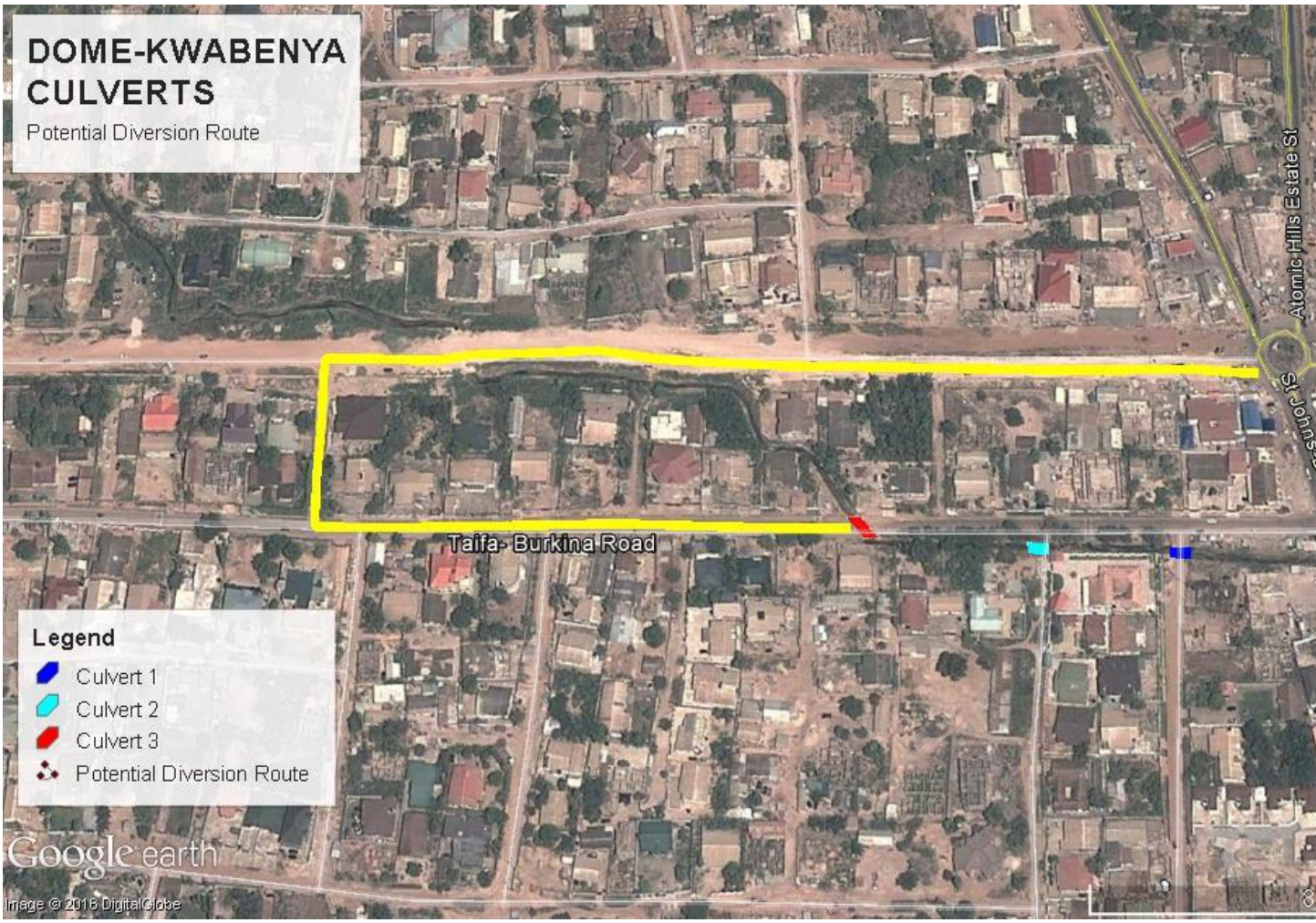

Plate 12 & 13: Miss Cynthia Oforiwaa (Left) and Alice Takyi (right)


Plate 14 &15 :Matthew Kwame (Left)/Vulnerable and Georgina Agbedanu, Sadia Yakubu and Charles Nelson(Right)

Plate 16 & 17 Dora Oforiwaa (standing Left) and Linda Entsie (Right)



Meeting with ECG,PCU and NCA (Left) and Meeting of all Telecommunication Networks and Project consultants(Engineering and Environmental) at the NCA office.


DOME-KWABENYA
CULVERTS
Potential Diversion Route
Atomic Hills Estate St
Taifa- Burkina Road
Legend
Culvert 1
Culvert 2
Culvert 3
Potential Diversion Route
Google earth
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